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POPULAR Computing WEEKLY

FREE GAMES CASSETTES

35p 15-21 September 1983 Vol 2 No 37

This Week



News Desk

Sinclair's dual-processor

IT now seems likely that Sinclair's new professional computer scheduled for launch in early 1984 will be a dual-processor machine

Also it should incorporate a monitor and twin-microdrives, all for around £400

A twin-processor machine has a number of advantages If the machine incorporates not only a 68000 chip but, as now seems likely a Z80 also then the machine will have the advantages of the 16/32 bit architecture of the 68000, while still being able to run the wealth of software currently available for the Spectrum

Another advantage would be a multi user capability, using perhaps Spectrums as stations on a network facility

Commented Sinclair's managing director Nigel Searle "You don t want to change all the variables at once In order to be competitive you have to change but you want to take

Continued on page 5

Design your own arcade games

QUICKSILVA is to launch the first of an entirely new type of program for the 48K Spectrum at the end of this month

It is a kind of arcade game generator "Somebody with no programming experience whatsoever should find it easy to make very convincing arcade games out of it" says its author, John Hollis.

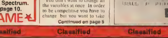
The program is menu driven The way *Games Designer*, as it is called works is as follows First, you set the format that the game will take — for example a character that moves from left to right and fires at the bottom of the screen, or one that sits in the middle of the screen and can be moved around under joystick control firing in any direction, or whatever

Next, you define as many sprites — moveable graphics shapes of size 32 × 12 pixels — as you want to appear in the game

After that you specify the

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★ ★ BRITAIN'S HOME COMPUTER WEEKLY ★ ★



15-21 September 1983 Vol 2 No 37

SUNSHINE

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12-13 Little Newport Street
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Telephone 01-734 1051
Published by Sunshine Publications Ltd
Typesetting origination and printing by Chesham Press Chesham Bucks
Distributed by S M Distribution
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ABC
MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS
ISSN 0265 0509

How to submit articles
Articles which are submitted for publication should not be more than 3 000 words long. The articles and any accompanying programs should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted.

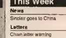
All submissions should be typed and a double space should be left between each line. Please leave wide margins.

Programs should, whenever possible, be computer printed.

We cannot guarantee to return every submitted article or program so please keep a copy. If you want to have your own program returned you must include a stamped addressed envelope.

Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

This Week



Editorial

The *Dr Who* game released by BBC Soft comes as a considerable disappointment, both to fans of the tv series and to home computer owners.

If ever there was a subject that cried out for special treatment, it is *Dr Who*. Devised by Terry Nation, the series has been enormously successful round the world since it was first screened back in the 1960s. It lends itself to a full-scale adventure, complete with Daleks and Cybermen, or at least to an innovative arcade game.

Instead, BBC Soft has produced a collection of four tired arcade games and cobbled them together to form the misleading title *Dr Who – The First Adventure*.

Not altogether surprisingly, the BBC was extremely quiet about the release of its *Dr Who* game. There was none of the fanfare of publicity that would have accompanied a more suitable offering.

There are any number of tv shows that could be linked to adventure or arcade games, particularly those shows with cult followings such as *Blake's Seven* and *The Prisoner*. Indeed, future shows may well be designed with the home computer market in mind.

However, if this marriage between tv and computer games is to be successful, there will have to be a vast improvement in quality over *Dr Who — The First Adventure*.

Next Thursday

A version of the popular board game where you must connect four discs together in any direction. Connect Four — next week's star game for the Commodore 64 by Les Allen.



Sinclair

Continued from page 1

tried and tested methods with you

"We have gained a large share of the consumer market through those methods and there is no reason why they cannot be applied to other fields"

For this reason he reckons that Sinclair would be unlikely to adopt a standard operating system for the new machine — such as Digital's VIP (see *Popular Computing Weekly* September 8)

"I am very anxious not to appear negative about VIP and Personal CP/M — I think they are very impressive but we will continue to go our own eccentric way

The new Sinclair machine may well find itself in the same market as IBM's low-cost Peanut machine — soon to be launched Obviously slogging it out toe to toe with IBM is something one thinks about very closely ' says Searle "Even so, it is not necessarily true that we will do well by making ours an IBM compatible product

We have been fairly successful by being different and we will most likely do the same for any new market



Sinclair managing director Nigel Searle

Games designer

Continued from page 1

levels of the game and which sprites are to appear in which level Each sprite also has a set path through which it moves which can be predetermined — you might set one to spiral down the screen, for example

In this way you can make up your own games in a very short space of time It is also possible to flip sprites so as to have different sprites with different directions of motion or perhaps a bird with wings that flap

John says You don't have to program a zap game — you could even have a game with a lawnmower and moles

If I've got it right people should be able to design games I haven't thought of '

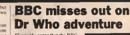
Games Designer, for the 48K Spectrum costs £14 95 and comes complete with an explanatory booklet and eight games ready-programmed on the system

John had been thinking about the program for over a year before getting down to writing it in April Even so, it was a huge software project and it took him over four months to complete it

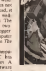
The program is the first to go out under the Software Studios banner, though it will be marketed by Quicksilva Software Studios is a software laboratory formed jointly by John Hollis and Nick Lambert Quicksilva's founders Earlier this year Rod Cousins took over the day-to day running of Quicksilva as both John and Nick expressed a wish to get back to programming

John is now working on the follow up to his successful *Time Gate* title while the first program from Nick's part of Software Studios should be out in the new year

Games designer John Hollis



BBC misses out on Dr Who adventure



IT would appear that the BBC has missed an opportunity

The new BBC Soft title for the BBC machine — *Dr Who The First Adventure* — is not an adventure at all Instead, it is a collection of four well known arcade favourites The four sections are a two dimensional maze, a *Frogger* a *Galaxians* and a computer version of the board game *The Black Box*

Dr Who is the first computer program the BBC has spun-off from a tv series A number of other software houses had already expressed interest in writing a *Dr Who* adventure but were turned down by the BBC

Said BBC Soft's Meyer Solomon A graphics adventure would have been a big project and entailed us going into assembly language programming

"Really, *Dr Who The First Adventure* is just a taster The next *Dr Who* program will probably be a far more elaborate program — an adventure possibly with some graphics and should be ready some time next summer '

Lambda burns its fingers

HONG KONG computer manufacturer, Lambda Electronics, has put its feet into hot water by launching its Lambda 8300 computer

Sinclair Research is taking legal action against the company in Hong Kong claiming that the machine is a copy of its ZX81 machine

Although the 16K Lambda machine is completely different in appearance to the ZX81 its internal circuitry and the majority of its Rom is alleged to be identical

Interestingly, the Lambda has a number of features that the ZX81 does not It has a joystick port a moving-key keyboard, a built-in loudspeaker and *Music* command, an automatic line number function and *Space Invader*-shaped pre-defined graphics keys

A Sinclair spokesman said 'There have been a number of court appearances in Hong Kong and we are now attempting to get an injunction to halt sales of the Lambda '

The Lambda must be particularly worrying for Timex who will soon launch the TS1500 machine — basically a 16K ZX81 — in the US

On display at Olympia show

NEXT week's Great Home Entertainment Spectacular exhibition will feature a number of new computer products

Top of the list must be the new Elan computer, on display for the first time since it was announced last month

Sinclair Research will show its Microdrive and Interface 1 publicly for the first time

Mattel will display the computer add-on for its Intellivision games console and its Home Control System for the Aquarius computer Milton Bradly will exhibit the vector graphics Vectrex games console

Acorn's Electron will be on show as will Atari's new 600XL and 800XL machines

The Great Home Entertainment Spectacular will be held at Olympia London, from September 17-25 Admission is £3 and £2 and the show will be open from 11 30 am to 9 pm each day except Monday September 19 when the show will open at 5 pm

Chinese move in on home market

CHINA is moving into the home computer market with help from Sinclair Research.

Nigel Searle, Sinclair's managing director, visited Shanghai and Beijing (formerly Peking) last month. The purpose of his visit was to discuss the feasibility of setting up assembly lines for the ZX81 and Spectrum micros, under the aegis of the South China Computer Company and the China Electronics Import and Export Corporation.

A Sinclair spokesman said that as a result of Nigel Searle's visit, Sinclair has now shipped small quantities of ZX81 and Spectrum components for local assembly and sale in China on a trial basis. It is hoped that if this initial trial is successful, it will lead to larger quantities of Sinclair personal computers being sold in China over the next few years.

Prism's Bob Denton

The Sinclair spokesman stressed, however, that discussions concerning the Chinese market were still at a preliminary stage.

The Chinese seem to be extremely keen on the project — a factory in Guangzhou has already been earmarked for the Sinclair scheme and the Beijing Software Academy is working on a program to produce Chinese characters on the Spectrum.

The Chinese are also keen on Micronet 800, Prism's telesoftware service. Richard Hease and Bob Denton of Prism both visited China last month with a view to setting up a Micronet-type service.

In addition, Prism is to stage a micro trade exhibition in Beijing in November, according to market development manager Steven Wood.

Acorn seek quotation

ACORN is to seek a quotation on the Unlisted Securities Market.

Merchant bank advisors Lazards and stockbrokers Cazenoves are handling the proposed share placement, believed to be about 10 per cent, which could raise around £6m for the company. A plan at the beginning of the year to raise money through a private share placement has been dropped because of a £3m limit.

Acorn cannot go for a full stockmarket quotation because the company is still less than five years old.

The USM has been very buoyant in recent months with a large number of new technology companies joining. However, feeling in the City now is that the enthusiasm could go out of the market, particularly following the financial troubles of companies like Grundy, ITCS and Dragon.

Oric six-slot

A SIX slot mother-board will shortly be available for the Oric 1.

The board, from Kenema Associates, will come complete with ribbon connectors and be supplied with either two or six sockets on board. Prices depend on the number of sockets, but should be between £35 and £45.

Cards to go with the mother-board include multiple parallel and serial cards and a speech synthesis module (the sort that builds up words from allophones). The speech card will sell for around £49.

The mother-board should go on sale in early October, to be followed by the first of the cards two weeks later.

Kenema Associates is an off shoot of the Tangerine Users Group and can be contacted at 1 Marlborough Drive, Worle, Avon.

Problems create problems

SINCLAIR is now manufacturing a Series 3 Spectrum which has cured one problem, only to create another.

The Series 3 machines are indistinguishable from any other Spectrums except that they have a slightly modified ULA. The change to the ULA has been made to ensure that the machine is compatible with all makes of colour television.

After the Spectrum was launched last year, it became apparent that the computer did not work successfully with some types of tv — some of the Hitachi models, for example.

Unfortunately, while the new ULA solves this problem, its introduction has lead to another difficulty. The new ULA causes some existing software programs written on earlier versions of the Spectrum to crash. The problem concerns the *In* command and it seems that any existing software that calls this routine will not run on the new machines.

A spokesman for Sinclair commented: "The new chip was introduced to overcome the tv problem and as a very unintentional side-effect the *In* command has been affected.

"We are only aware of one or two cases where it affects software. It looks as though it doesn't happen very often and none of our own software has been affected."

Sinclair turnover doubles

SINCLAIR Research's pre-tax profits for the year to March 31 1983 stood at £14.03m. This compares favourably with the previous year's £8.55m profits.

Turnover doubled from £27.17m to £54.53m, while earnings per share rose from 106p to 207p.

Chairman Sir Clive Sinclair called the figures "encouraging" but admitted the company had met some problems. "In particular the US market, which we serve through our technology and name licensing agreement with Timex, has been badly affected by a price war since Christmas which has driven the market leaders into heavy losses and resulted in a much lower sales volume in money terms than we expected.

"Fortunately the UK market proved better than anticipated which partly compensated."

Sir Clive Sinclair

Sir Clive revealed that the company planned to introduce products in new market areas and noted: "We expect to be leaders in the flat screen television field where we are confident that we have the best technology."

● Prism Microproducts, Sinclair's UK distributor, announced that turnover in the first year of its operation totalled £10m. Pre-tax profits were a rather more modest £234,000.

Artic on the offensive

ARTIC Computing has launched its autumn offensive on the software market with the release of 21 new titles.

Ten of the programs are designed for the Spectrum and five each for the ZX81 and Vic20. The final program is *Asteroids* for the 48K Oric.

The Spectrum games include *Jigsaw*, *Road Racers* and *Snake*, the last of which is also available on the Vic20.

Artic, which now has a range of 62 titles, plans to release further programs in October for the BBC, Atari and Commodore 64 machines.

● Arnold Wheatons Software has appointed Artic its sole distributor for a range of Spectrum, BBC and Apple programs including *Angle Turner* and *Weather Station*.

The ultimate

ULTIMATE Play the Game has announced two new titles for the 48K Spectrum.

They are *Lunar Jet Man*, the follow-up to *Jet Pac*, and *Atic Atac*, a haunted house game where you can choose your own character.

Both will cost £5.50 and be available at the end of September.

Open Forum entries

As a relatively new but keen reader of *Popular Computing Weekly* I am interested in the possibility of submitting programs to Open Forum. However, I have as yet no printer for my Vic20 and am wondering whether entries for Open Forum have to be sent in the form of a computer print-out or can be submitted in some other way.

A R Jenns
58 Endhill Road
Kingstanding
Birmingham B44 9RP

We get a number of queries on how to submit programs to *PCW*, so a brief resume of the procedure seems to be in order.

Firstly, please do include a print-out (remembering to put a fresh ribbon in the printer) of the program. It is also helpful to have a copy of the program on tape, but do not forget to keep a copy for yourself. Always state which computer the program is for (you would be surprised how many people forget to include this information), and how much memory it takes up. A brief description of the program and how it works is essential — it is not enough to say that the workings of a program are obvious or covered in Rem statements.

Finally, include your name and address on the tape and the print-out as well as the accompanying notes. Also, please include a SAE if you want the tape returned.

In praise of Pimen

I think P Devereau (Letters *PCW* 11-17 August) should be forcibly suppressed. How dare he insult Automata's wonderful advertising. Their back page is the first thing I turn to every week — in fact, it's the main reason I buy your magazine.

The Pimen and his friends are never too busy to reply to your letters and when you meet them at exhibitions they are always having a party for their customers. I am never disappointed with their games, which are always delivered by return of post — the last one had a free pound note present in it.

Don't be such a misery, P Devereau. Automata are the only people who can make you laugh while you enjoy their programs. Like the Piman says in his free hit song "Give it a try man".

Karen Ross
109 Honeysuckle Road
Bassett
Southampton

We think the Piman deserves some praise too.

Home-brew program

After being interested in computing for some time, I acquired my first computer a couple of weeks ago — a Sinclair 16K Spectrum.

After non-stop programming for a week, I started to write my first home-brew program, a dx propagation predictor. All amateur radio operators will know what I mean by "dx".

I have only completed one part of it and it is working successfully. I decided to delay the other parts and start on a radio ham log book program. I got all the main material written down and working and I was very pleased with myself, until it came to saving the information without saving the actual program all the time. Have you a solution to my problem?

As you may now have gathered I'm trying to use my computer in conjunction with my other hobby, short wave listening, and with any luck actually operating my own station. Also have you any other correspondents with ZX Spectrum computers who are "Hams" or "SWLs" and if so do they know of any decent programs?

Paul Martin (16)
18 Wilkinson Close
Temple Hill
Dartford
Kent DA1 5JT

PS I have just started to write my own program and I would like to know how to make the screen scroll laterally, so that it looks as if a plane is moving horizontally when really the scenery is moving.

I do not have any programs on top to solve your problems, but our readers may be able to send in some solutions.

We hope to be doing some material on micros and radio in the near future.

Scrabble words

Regarding Steve Freedman's letter (Scrabble warning, *PCW* 1-7 September), I have written the following routine to print the basic forms (ie, no -ed, -s, -ing etc) of all the words in the Scrabble dictionary.

```
100 LET l=2
150 LET f=0
200 LET a=40222
250 IF a>=40302 THEN LET l=3
251 IF a>=41302 THEN LET l=4
252 IF a>=45640 THEN LET l=5
253 IF a>=50959 THEN LET l=6
254 IF a>=53856 THEN LET l=7
255 IF a>=59555 THEN LET l=8
270 INPUT
300 IF PEEK a=0 THEN PRINT   LE
T a=a+1  GO TO 300
310 IF PEEK a>100 THEN GO TO 5C
2
316 IF f=1 THEN LET a=a-1  LET
f=0
320 FOR b=a TO a+l-1
330 PRINT CHR$ PEEK b,
340 NEXT b
345 PRINT
350 LET a=a+l
360 GO TO 250
500 LET w=INT (PEEK a/100)
510 IF w=1 THEN LET x=PEEK a-1
1  LET x=x/4
520 IF w=2 THEN LET x=PEEK a-19
5  LET x=x/4
525 DIM a$(w)
530 FOR b=1 TO w
540 LET a$(b)=CHR$ PEEK (a+b)
550 NEXT b
600 FOR b=1 TO x
610 PRINT a$,
620 FOR c=1 TO (l-w)
630 PRINT CHR$ PEEK (a+w+c),
640 NEXT c
645 PRINT
650 LET a=a+(l-w)
660 NEXT b
665 LET a=a+1+w
670 GO TO 250
```

To use the routine
Clear 24499
Load "C" Code (from Scrabble tape)
Clear 40000
then Run the accompanying program

Paul Ockenden
61 Albourne Close
Brighton
East Sussex BN2 5FX

Unwanted chain letters

It appears that someone is using the names and addresses of contributors appearing in your Letters page to promote a chain letter scheme and you may possibly share my view that you should do what you can to discourage such exploitation in the interests of your own reputation.

I am enclosing a letter I received today which I believe was prompted by the appearance of my own name and address in your issue of 1-7 September. First there are the specific references to home computers, secondly the envelope bears a post code I never bother to give when completing any coupons from computer mags.

Perhaps you may wish to consider whether it is a good idea to give full addresses — particularly when they often pin point the location of valuable computer hardware.

John Randley
East Sussex

We have received several complaints that someone is circulating a chain letter, using names and addresses taken from our Letters page. Anyone who receives such a letter should either send it to us or throw it away immediately.

Our policy on publishing full names and addresses has always been to show that the letters are genuine and that the writers are not afraid of being identified with the views they have expressed. At the same time, we have always witheld full addresses where requested to do so.

However, if people writing letters to *PCW* are bombarded with unsolicited material such as chain letters, we shall be forced to stop publishing any full addresses.

Hill St Blues

A new game for 48K Spectrum by A Follin and E Page

This program is rather unusual in that it is a fast moving arcade-style game for two players in Basic

One player takes the role of a New York cop the other takes the role of an infamous villain whose idea of fun is knocking down old ladies in his Ford Mustang. Naturally the cop has devoted his working life to putting an end to the villain s reign of terror

The main program is a loop which involves key tests updating car positions and checking for crashes, etc This loop contains a machine code subroutine for scanning the keyboard which places the values read in locations 60001 to 60004 The main loop then uses these values for changing the cars positions and directions The other subroutines are called from this loop in the event of a crash

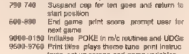
Program notes

Lines	
40-60	Clear memory for m/c subroutines call subroutines for initialising and printing instructions
90-290	Main loop
120 147	Call m c keyscan routine and update accordingly
150-200	Move cars and check for crash etc
260-290	Check if pedestrian on screen If not, and random number is greater than 7 then randomise new position
700 740	Suspend cop for ten goes and return to start position
600-800	End game print score prompt user for next game
9000-9150	Initialise POKE in m/c routines and UDGs
9500-9760	Print titles plays theme tune print instructions set up screen and game variables

After each game is finished options are given to see the instructions again or not If so a jump is made to line 9590 This is in the middle of the instruction routine and cuts out the opening titles.

Machine Code Routines

50000 50015	Attribute change. Location 60000 contains the value of the screen attributes as on page 199 of the Spectrum manual
50020 50068	Keyscan routine Checks all eight rows for left and right keys pressed and places resultant values in locations 60001-4
50070-50082	Check keys for setting up roadblock If key pressed BC register contains 1 on return else it contains 0
60000	Attributes
60001	Police car turns left
60002	Police car turns right
60003	Villain s car turns left
60004	Villain s car turns right





```
0 REM © DEMON SOFTWARE 1983
1 REM
10 REM ************************
20 REM **** HILL ST.BLUES ****
30 REM ************************
40 CLEAR 49999
50 GO SUB 9000  REM INITIALISE
60 GO SUB 9500  REM INSTR
70 REM
80 REM ************************
90 REM **** MAIN SECTION ****
100 REM ************************
110 PRINT #1  FLASH 1, INK 7, PAPER 0 AT 0,11, GET READY   FOR I=8 TO 0 STEP -1  PRINT #1,AT 1,15,I  BEEP .5,8-1  NEXT I  PRINT #1 AT 0 11,          ,AT 1 15,
120 FOR I=50001 TO 50006  POKE I,0  NEXT I  RANDOMIZE USR 50020
130 LET PCD=PCD+(PEEK 50000)-(PEEK 50001)  LET RCD=RCD+(PEEK 50004)-(PEEK 50003)
131 IF USR 50070=0 THEN GO TO 140
132 IF BLOCKS=0 THEN GO TO 140
133 LET DROP=1  LET BLOCKS=BLOCKS-1
140 IF PCD=5 THEN LET PCD=1
142 IF PCD=0 THEN LET PCD=4
145 IF RCD=0 THEN LET RCD=4
147 IF RCD=5 THEN LET RCD=1
148 IF SUS>0 THEN LET SUS=SUS-1  PRINT #1 AT 1,0 ("            " AND SUS=0)
   FOR J=1 TO 15  NEXT J  GO TO 200
150 LET X=PCX  LET Y=PCY  LET X=X+(PCD=2)-(PCD=4)  LET Y=Y+(PCD=3)-(PCD=1)
155 IF X=-1 OR X=32 OR Y=-1 OR Y=23 THEN GO TO 700
160 IF Y=RCY AND X=RCX THEN GO TO 800
170 IF ATTR (Y,X)=8 THEN LET BLOCKS=BLOCKS+1  GO TO 190
180 IF SCREEN$ (Y,X)<>" " THEN GO TO 700
190 PRINT INK 7,AT PCY PCX, " ",AT Y X,CHR$ (143+PCD)
195 IF DROP=1 THEN PRINT AT PCY,PCX, INK 5 "■"  LET DROP=0
197 LET PCY=Y  LET PCX=X
200 LET X=RCX  LET Y=RCY  LET X=X+(RCD=2)-(RCD=4)  LET Y=Y+(RCD=3)-(RCD=1)
205 IF X=-1 OR X=32 OR Y=-1 OR Y=22 THEN GO TO 280
210 IF Y=PCY AND X=PCX THEN GO TO 800
220 IF ATTR (Y,X)=8 THEN GO TO 800
230 IF SCREEN$ (Y X)<>" " THEN GO TO 800
240 IF Y=BY AND X=BX THEN LET YEARS=YEARS+1
250 PRINT INK 2,AT RCY RCX, " ",AT Y,X,CHR$ (147+RCD)  LET RCY=Y  LET RCX=X  LET YEARS=YEARS+.5
260 IF BIDD=1 THEN LET BC=BC-1: IF BC<=0 THEN LET BIDD=0
270 IF BIDR=1 THEN GO TO 120
275 IF RND< 7 THEN GO TO 120
280 LET BIDD=1  LET BC=15  LET BX=INT (RND*30+1)-1  LET BY=INT (RND*22+1)-1  IF SCREEN$ (BY,BX)<>" " THEN GO TO 280
300 PRINT FLASH 1, INK 6 AT BY,BX,"*"  GO TO 120
700 REM ************************
710 REM ***** COP CRASH *****
720 REM ************************
730 IF ATTR (X,Y)<>5 THEN PRINT AT Y X, " "  LET BIDD=0
740 PRINT AT PCY PCX, " "  LET PCY=0  LET PCX=0  LET PCD=2  LET SUS=10  PRINT AT 0,0, INK 7, "■"  PRINT #1 AT 1 3, FLASH 1, "COP SUSPENDED FOR 10 GOES"  GO TO 200
800 REM ************************
810 REM ***** ROBBER CRASH *****
820 REM ************************
830 PAPER 2  INK 7  BORDER 2  CLS  PRINT AT 3 0,
```

YOU'RE

```
840 PRINT AT 10,0,
```

NICKED

```
850 PRINT AT 18,0 "YOU GOT SENTENCED TO "  INT YEARS " YEARS"
860 PRINT BRIGHT 1, FLASH 1 AT 21 0, "PRESS ANY KEY FOR ANOTHER GAME"  PAUSE 0
870 INPUT "DO YOU WANT INSTRUCTIONS (Y/N)"  LINE A$
880 IF A$="Y" OR A$="y" THEN GO SUB 9500  GO TO 100
890 GO SUB 9710  GO TO 100
9000 REM ************************
9010 REM ***** INITIALISE *****
9020 REM ************************
9030 PAPER 5  INK 1  BORDER 5  CLS
9040 RESTORE 9050  FOR I=50000 TO 50018  READ A  POKE I,A  NEXT I  REM ATTRIBUTE CHANGE ROUTINE
9050 DATA 58,80,234,33,0,88,17 1,88,1,0,3,119,237,176,201
9060 FOR I=50020 TO 50066  READ A  POKE I A  NEXT I  REM KEY TEST ROUTINE
9070 DATA 62,240,219,254,203 71,40,11,203,79,32,10,62,1 50 80 83 4,24 6,62 1,50,87,236
9080 DATA 62,15,219,254,203,79,40,11,203,71 32 10 62 1,50,180,83,24 6,62 1,50,80,234,201
9085 FOR I=50070 TO 50082  READ A  POKE I A  NEXT I
9087 DATA 1,0,0,62,240,219 254,203,87,192,14,1,201
9100 DIM A(15)  DIM B(15)  FOR I=1 TO 15  READ A(I),B(I)  NEXT I  REM TUNE
9110 DATA [illegible]
9120 FOR I=USR "A" TO USR "K"+7  READ A  POKE I,A  NEXT I
9130 DATA 124,124,60 126,189 189,124,124,0,0,255,251,235,251,255,0,124,124,124,189,126,60 124 124,0,255,255,219,223,255,0,0
9140 DATA 124,124,60 126 124 124,124,124 0,0 255 251,251,251,255,0,126,124,124,124,189,60 124 124,0,255,255,223,223,255,0,0
9150 DATA 255 129,129,129,129,129,129,255,0,0,126,60 165,165,0,0,60,60,24,66,60 66 24 189
9160 RETURN
9500 REM ************************
9510 REM ***** INSTRUCTIONS *****
9520 REM ************************
9530 PRINT AT 3,0,
```

HILL ST. BLUES

```
,AT 10,0,
9535 LET BEEP=1  FOR I=30 TO 0 STEP -1  PRINT AT 0 I, "■"  BEEP .2,BEEP  LET BEEP=-BEEP  NEXT I  PRINT AT 0,0,
9537 FOR I=1 TO 20  NEXT I
9540 FOR I=1 TO 15  BEEP A(I) B(I)  NEXT I
9550 LET COLOR=40  PRINT AT 20,1 "PRESS ANY KEY FOR INSTRUCTIONS"
9560 IF INKEY$<>"" THEN GO TO 9600
9570 POKE 50000,COLOR  RANDOMIZE USR 50000  LET COLOR=COLOR+1  IF COLOR>48 THEN LET COLOR=40
9580 FOR I=COLOR TO COLOR-20 STEP -10  BEEP .05 1  NEXT I  GO TO 9560
9590 PAPER 0  BORDER 0  INK 0  CLS
9600 LET A$="      This is a game for 2 players, one a cop and the other an evil villain. The object of the game for the villain is to get as big a sentence as possible.  To do this the villain must avoid capture and knock down poor old ladies. The object of the game for the cop is, of course, to stop the villain."
9610 LET A$=A$+"
The movement controls are -
           COP              ROBBER
    Left      Right    Left      Right
     1          2        9          0
     q          w        o          p
     a          s        l        ENTER
CAPS SHIFT      z     SYM SFT    SPACE
In addition, the cop can press any of the following keys to set up a road block -
3,e,d or x."
9620 LET A$=A$+"      If the cop crashes or runs down a pedestrian, he will be suspended for ten goes while he appears in court. Meanwhile, the robber is running free.       If the robber crashes he will be caught by foot patrols"
9630 POKE 50000,56  FOR I=1 TO LEN A$  PRINT A$(I),  IF A$(I)<>" " THEN BEEP .01,50
9640 NEXT I
9700 PRINT #1,AT 1,0, BRIGHT 1, FLASH 1 "PRESS ANY KEY TO BEGIN"  PAUSE 0
9710 FOR I=50 TO 0 STEP -5  POKE 50000 I  RANDOMIZE USR 50000  FOR J=I+10 TO I-10 STEP -5  BEEP .01,J  NEXT J  NEXT I
9715 LET SUS=0  LET BIDD=0  LET DROP=0  LET BLOCKS=5  LET BX=100  LET BY=100  LET PCX=0  LET PCY=0  LET PCD=2, LET RCY=19  LET RCX=31  LET RCD=4  LET YEARS=1
9720 PAPER 0  BORDER 0  INK 6  CLS  PRINT AT 3,0
9730 PRINT
9740 PRINT
9760 PRINT INK 7 AT 2 0 "■"  INK 2,AT 19,31, "■"
9780 RETURN
```

GRAPHICS -

A=▮ B=▬ C=▮ D=▬ E=▮ F=▬

G=▮ H=▬ I=□ J=▬ K=*

PLEASE NOTE THE FOLLOWING -

240 IF Y=BY AND X=BX THEN LET YEARS=YEARS+1 GO TO 280

240 IF CODE SCREEN$ (Y,X)<>32 THEN GO TO 800

PLEASE ADD THE FOLLOWING TO THE END OF LINE 280 -
  PRINT AT BY BX " "

CHANGE ALL RANDOMIZE USR TO LET Z=USR

TO INCREASE THE FREQUENCY OF THE PEDESTRIANS, DECREASE THE .7 IN LINE 275

Forces of good and evil

***David Kelly** talks to Roy Carnell and Stuart Galloway of Carnell Software*

"As you see, we have a good view of the woods," grins Stuart gesturing from the offices of Carnell Software towards the window and the timber yard next door.

Woods, forests, trolls, goblins and elves. Enchanted valleys, the forces of good and evil. All of these formed part of the world of Stuart Galloway and Roy Carnell long before they formed Carnell Software and wrote adventure programs.

Both grew up in Kirkcaldy, Scotland, and from an early age both were fascinated by any flights of the imagination they could lay their hands on. "Roy is a nutter on fantasy — quite an authority in fact, whereas I am more of a science fiction fan," explains Stuart. They avidly collected shelf-upon-shelf of fantasy fanzines — *Famous Monsters of Film Land* and the like — and devoured all the 40s Hollywood B movies they could find. They even designed their own board games.

At 13 they made their first film in 8mm — *The Mummy's Revenge* with Roy swathed in bandages.

From then on, both set out for a career in film production. Undaunted by a teacher who informed them that people from Scotland didn't get jobs in the movies, both managed to get into Birmingham Film School.

While at Birmingham they met a man called Wally Vevvers who had created most of the special effects on Kubrick's film *2001*. He offered them a job and, almost before they knew it, they were thrown in at the deep end working in the team creating the special optical trickery for *Superman 1*.

After that they worked on a number of films. Probably the closest to their hearts, and the one on which they worked most on their own, was Boorman's *Excalibur* set in the mythical days of Merlin and the Arthurian legends.

Fantasy on film, but not exclusively. Any form of escapism fascinated Roy. Ever since the advent of the micro he had wanted one — he could see it had possibilities. Like so many, he was only able to afford one when the ZX81 came out — and that is really when Carnell Software started, back in November 1981.

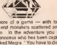
"I started programming, but it took a while for the first adventure to come," says Roy. "I started to write *Volcanic Dungeon* experimenting with program routines and on bits of paper while I waited for my 16K Ram pack to turn up."

Roy had plenty of time to program because of the way the British film industry works — or rather doesn't. People like Roy and Stuart at that time were only working about three or four months a year. So Carnell really sprang out of a need to find something to do to fill up the spaces.

"I took the computer over to Stuart," explains Roy, "with the idea of selling programs by mail-order and he fell about with hysterics because I couldn't get the program I had written to load!"

"I suppose we are frustrated story writers," says Stuart. "And a computer game is just like being able to take a role in one of our stories."

"We had never played an adventure or seen one until we wrote *Volcanic Dungeon*," says Roy. "That's why it is quite unlike anything else.



"It is more of a game — with lots of treasures and monsters scattered around a dungeon. In the adventure you must rescue a princess who has been captured by the wicked Magra. You have to discover what weapons to use against which monster — just like a game of cards, when you go in to fight the Magra you have to have a good hand of weapons," says Roy.

"It is an adventure you can play again and again — it is always different," explains Stuart. "We've even got one guy who has made a peg-board to plot the treasures and monsters for each game. Another chap wrote to us after playing it for three months without finding the princess.

"That is why we decided to hold the Volcanic Dungeon Championships earlier this year — the winner took 53 minutes.

"You have got to know your mythology — or to have seen a few Sinbad films. Most people when they start out get killed in the first couple of caverns until they get more experienced."

In April last year rumours were rife that Sinclair would announce a new computer. Stuart and Roy reckoned it would be a 32K colour machine with the same Basic as the ZX81 so they started writing a new game accordingly — which became *Black Crystal*.

Roy was back in Scotland because they were both unemployed again. Stuart went to Earls Court when the Spectrum was announced. "I fought tooth and nail for one of those leaflets to find out the details — and we were very lucky — it was just what we had hoped."

Work on *Black Crystal* pressed on. "If we are ever stuck for inspiration we take a walk to the pub instead of the car. We





Roy Carnell (left) and Stuart Galloway — preparing for Magra

wanted a multi-program game with graphics with a central map with locations on it which acted as the entry points to other programs.

The problem with most adventures is plot — they don't have one. From being in films and being long-frustrated story writers we realised that the most important thing was that the game should have a purpose. An adventure should be like a novel. It took many walks to the pub and our phone bills went through the roof — you always seem to get inspiration late at night — but we decided to create our own entire world of mythology."

All of Carnell's games centre around the Third Continent — a long time in the past when the land masses of Europe, Africa and America were one. At the moment they are concentrating on the European part — the Black Mountains, its foothills and The Enchanted Valley.

In *Black Crystal* you must find the seven Rings of Creation and use them to destroy the forces of evil. When correctly positioned around the source of evil — the Black Crystal — it can be destroyed.

By the time the Spectrum arrived Roy had written most of *Black Crystal*. Then things began to get hectic. They both began work at Shepperton studios on a new film — yet to be released — called *The Keep*. At the same time money began to get tight. "Everybody goes on about how good it is — but that's rubbish," says Stuart. "You have good times and bad times just like any other industry — and last summer was very difficult. Following the Spectrum's launch there was a lot of uncertainty.

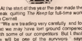
"Roy's account went badly into the red — that's one of the reasons *Black Crystal* was delayed until November.

"That is when we formed Carnell Software more formally.

"We are much older and wiser now," says Roy, "but for a while we couldn't cope. We were trying to do two jobs at once — Carnell and the film — and demand for *Black Crystal* was much greater than we imagined it would be."

"We were doing the packing ourselves," explained Stuart. "I had to go sick at one point to get a day off work to send out the final batch of 870 *Black Crystals*.

"Christmas was sheer panic." They thought it would slow down and it didn't. At Christmas they held packing parties with friends coming down for a Chinese, some beer and some packing!



At the start of this year the pair made the break, quitting *The Keep* for full-time work on Carnell.

"We are treading very carefully and for that we may have lost ground compared with some of our competitors. But I think we will be one of the survivors," says Stuart, "rather than one of the balloons that goes pop in a very spectacular way."

He reckons that to complete Carnell's plans for Christmas this year will cost the company over £120,000.

Most important of the new titles is the sequel to *Volcanic Dungeon* and *Black Crystal* — *The Wrath of Magra*, available in November, at first for the Spectrum. Again it is set in the mythical Third Continent. Chronologically it takes place at the same time as the *Black Crystal* was destroyed and the great battle was fought when the armies of evil and the Tree of Life were destroyed.

That was at the end of the Third Age when the balance of the forces of good and evil was restored.

So, the Fourth Age begins, as does the plot of *The Wrath of Magra*. You play the role of the hero from *Volcanic Dungeon*. The Snow Giants take the body of Magra back to her castle in the Black Mountains where she is brought back to life by the powers of black magic. She is furious with you and recaptures the princess, imprisoning her in the castle. "You have to rescue her and kill Magra — and Magra is just hoping you'll try to fight her on her own ground," says Stuart.

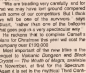
It will be a three part adventure which will come complete with a 200 page paperback book detailing the history of the Third Continent and all of the spells needed for the game. "To use a spell it will be necessary to assemble the appropriate ingredients," explains Roy. "For example, to make a Saintly Staff you need to call up a dead saint — and you will need a lot of spiritual power to control it. Among the ingredients you might need is graveyard dust — and you would have to find that before making your Saintly Staff.

"We wanted to have an adventure where you can go to bed at night and take the book with you. What you will have is a real spellbook which you will have to learn to use — it is like you are a novice wizard thrown in at the deep end. You will have to go away and learn how to cope," says Roy.

"We don't see why you should get away with just pressing buttons."

During the three stages of *The Wrath of Magra* you must progress under the Black Mountains, up through the Mines and into Magra's castle.

"And when you get there, you will have to be very well prepared," warns Roy. ■







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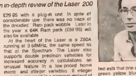
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A taste of the Orient

***David Aubrey Jones** presents an in-depth review of the Laser 200*



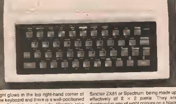
When the Laser 200 was launched at the Earls Court computer show in London last month it generated considerable interest. In spite of Sinclair s recent price cuts the Laser reduced the price of a micro offering both colour and sound by a full £30 So just how well does it compare with its more expensive rivals? Is it rubbish from the Far East or is it a serious contender for your money?

Manufactured by the Hong Kong company Video Technology for £69 95, the Laser 200 computer comes complete with power supply all leads three manuals and a cassette containing eight interactive programs (games and more serious applications/Basic and machine code) The Laser has a tough cream coloured, plastic case with separate rubber keys as per Spectrum However these are harder and have a more positive feel than those of their competitor They auto repeat and there is a useful click sound when they are pressed but I noticed an occasional tendency for them to bounce

On the top right is a grille to help dissipate the heat generated inside the case — there was no sign of any overheating even in the hot weather A power-on light glows in the top right-hand corner of the keyboard and there is a well-positioned on off switch on the side (Sinclair take note) At the rear are connections for TV monitor cassette and power together with two expansion ports One of these is for extra Ram and the other for some peripherals such as joysticks (£19 95 pair) and printer (Centronics interface £19 95 four-colour printer £149 95)

Four K of Ram is built in leaving less than 2K available for programs However due to the fact that keywords are stored in a tokenised form some programs are possible within it.

When the Laser arrives in the shops memory will be expandable to 20K for £29 95 with a plug-in unit In spite of considerable use there was no trace of the dreaded "Ram pack wobble" Later in the year a 64K Ram pack (£59 95) will also be available



At the heart of the Laser is a Z80A running at 3 58MHz, the same speed as that of the Spectrum The Laser also supports double precision variables for increased accuracy in calculations an unusual feature in a low priced home micro and integer variables If integer variables are used in a program instead of real variables a speed increase of some 20 30 percent can be obtained which would be very useful for games programs

When the Laser is first switched on text is displayed in light green on a dark green background with a black border This was clear and easy to read The background colour can also be changed to dark orange and inverse characters can be printed The chip that handles the display is the same as that used in the Acorn Atom and Dragon computers This allows nine colours on the screen at a time in text mode (32 columns × 16 lines) in the form of "Battenburg" graphics characters

These are similar to those found on the Sinclair ZX81 or Spectrum being made up effectively of 2 × 2 pixels They are displayed in one of eight colours on a black background and allow a resolution of 64 × 32 The colours are green yellow blue, red, buff cyan magenta and orange

A higher resolution mode (128 × 64) is also available The resolution of this is not as high as that of the Spectrum but the colour resolution is actually higher each pixel or point can be set to a different colour (unlike the Spectrum there are no restrictions in the form of only two colours per character area in this mode)

Eight different colours can be used in high resolution four at any one time The two sets that one can choose between are green yellow blue and red or buff cyan magenta and orange The colours were steady and fairly sharp on all three colour televisions the Laser was tested with

The Laser uses a form of Microsoft Basic contained in a 16K Rom All the standard commands and functions are available including the facility of multi statement lines Strings are supported together with *Len Str$ Val Left$ Right$ Mid$ Asc Chr$* and *Inkey$* Arrays both numeric and string can be of any length and have up to three dimensions There is also no restriction on the length of variable names, although only the first two characters are recognised

An interesting and unusual feature of the Basic are some very powerful *Print* commands As well as the usual *Print@* and *Print Tab*, *Print Using* allows the formating of output in a similar way to the language Cobol which is often used for business applications For example

PRINT USING "###.##" A where A = 2·36428 will produce ▼2 36

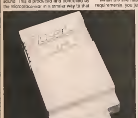
There are seven field specifiers that *Using* will support to allow the printing of output to your exact requirements Structured programmers will also be pleased with the inclusion of an *If Then Else* statement

The high resolution graphics commands are less extensive than on some micros there are no *Draw* or *Circle* commands It is left to the software houses to fill this gap *Set (x y)* plots a dot at a specified location on the screen (where *x* is a value from 0 to 12 and *y* a value from 0 to 63) and *Reset (x y)* blanks it out *Point (x y)* tests a point to see if it has been set — useful to see if your missile has hit a space invader!

The *Color* command changes the current ink and paper colours (note American spelling) It takes the form *Color F B* where *F* is a number between 1 and 8 the foreground or ink colour you wish to use and *B* is either 0 or 1 the background or paper colour you require Some interesting effects can be obtained in the higher resolution mode by switching between background colours, since this also changes all four colours currently in use It is somewhat dramatic to watch your picture made up of the colours green yellow

blue and red instantaneously change into buff cyan magenta and orange! In contrast changing the paper colour in the low resolution mode has no effect on the ink colour

Mention has already been made of sound This is produced and controlled by the microprocessor in a similar way to that



of the Spectrum Even speech is possible using machine code by switching the port that controls the speaker directly but from Basic you are limited to the *Sound* command This is similar but slightly less versatile to *Beep* on the Spectrum Two arguments following *Sound* control the pitch in semitones and the length of the note

```
SOUND pitch length
```

where pitch is a number from 0 to 31 and length is a number from 1 to 9 The manual provides a table that details the notes on the musical scale and their equivalent pitch values Thus

```
For N=1 to 5
READ P L SOUND P L
NEXT
DATA 29 4 31 4 27 4 15 4 22 8
```

will play a tune that will be well known to BBC computer owners (Close Encounters !)

A fierce controversy has waged over the pros and cons of the single key entry of keywords In this the Laser should please everybody If you like it it is there and if you don't, you can type all command words in full In practice I found this very useful I ended up using a combination of the two methods — single key entry of the most commonly used words and letter entry of the others This feature should prove very helpful to beginners

Another strong feature of the Laser is editing which is often difficult or lacking on the lower priced micros Full on screen editing is supported After listing the section of the program you wish to alter you shoot to the exact point using the cursor keys Extra space can then be added in a line using *Insert*, words can be deleted using *Rubout* and corrections can be made

When the line has been altered to your requirements you just press *Return* and it will be stored in its new form One thing that did take a bit of getting used to, however is the fact that *Rubout* works in the opposite direction to the delete key on most computers — it deletes characters to the right and not to the left Annoying

Loading and *Saving* to cassette tape takes place at 600 baud twice the speed of the ZX81 but considerably slower than the top rate of many of the other newer micros The cassette interface was fairly reliable but difficulties were experienced with one out of five recorders tested It proved very difficult to *Load* programs with this recorder when they had been *Saved* on one of the other recorders

A useful loading sign appears at the bottom left of the screen giving information on the program found, etc and a *Verify* command is included Data files are also supported using *Print#* and *Input#* where the values of the specified variables or data are saved on to cassette tape

A review of the Laser would be incomplete without some mention of the documentation that comes with the machine Two small booklets are provided and a manual on Basic The first booklet the 'user manual' provides brief details on setting up the Laser while the other contains a collection of 21 *Basic Application Programs* A nice idea but most are uninspired with titles such as *Gallon and Litre Word Guessing* and *Sorting Words* The Basic manual assumes no computer knowledge and starts with 'What is a computer?' A lot could have been done to make it more friendly and the manufacturers say they are making changes to it.

In conclusion the Laser 200 offers reasonable value for money It is suited to the first-time user who initially requires a basic machine that can be expanded at a later date Its main deficiency is the fact that characters cannot be redefined as on the Dragon However by using the higher resolution mode this can largely be circumvented and quite reasonable character shapes can be drawn and used in machine code games etc

Ultimately, the success of a home micro depends to a large extent on the ready availability of good cheap cassette software ■

LASER 200 FEATURES

CPU Z80A running at 3.58 MHz
MEMORY 16K Rom with Microsoft Basic Interpreter
4K Ram expandable to 64K
DISPLAY Text — 32 × 16
Graphics Mode (0) — 64 × 32 (9 colours)
Graphics Mode (1) — 128 × 64 (8 colours 4 at any one time)
Colours — black green yellow blue red buff cyan magenta and orange
SOUND Single channel from speaker
CASSETTE 600 Baud with any ordinary cassette recorder
EDITING Full on screen editing
KEYBOARD Moving rubber with auto repeat and audible click on all keys Optional single key entry

BASIC COMMANDS
STATEMENTS

CLOAD	END	LPRINT	PRINT#
CLEAR	FOR TO STEP	MODE	READ
CLS	GOSUB	NEW	REM
COLOR	GOTO	NEXT	RESET
CONT	IF THEN ELSE	OUT	RESTORE
COPY	INPUT	POKE	RETURN
CRUN	INPUT#	PRINT	RUN
CSAVE	LET	PRINT	SET
DATA	LIST	PRINT TAB	SOUND
DIM	LLIST	PRINT USING	STOP
			VERIFY

FUNCTIONS

ABS	INKEY$	NOT	SIN
AND	INP	OR	SQR
ASC	INT	PEEK	STR$
ATN	LEFT$	POINT	TAN
CHR$	LEN	RIGHT$	USR
COS	LOG	RND	VAL
EXP	MID$	SGN	

Musical inspiration

***Peter Bartley** examines the musical abilities of the Vic20 in the fifth of a six-part series*

You've all heard random music on the Vic Not very inspiring is it? (Don't know what all this "Ludwig business in the book is about) Try Figure 1 for somewhat improved music

Well it's a start, anyway The data read in lines 30 40 and 60 produces a continuous bassline over which are played random notes (line 50) defined in line 10 The notes are defined so that they sound OK whatever stage the bass is up to This is a very powerful method of ensuring that the music is always tuneful (if a little bland) The only hard part about it is figuring out the bass — I've heard a couple of good rock 'n roll lines and it should be easy to think up some others

Probably the reason there is a very little tuneful Vic music about is that it takes so much time and effort to produce Yet surprisingly musical effects are fairly easy to simulate Figure 2 is a rather neat little syndrums program Play them using keys 1-8, and try hitting the same key very quickly a few times

Still on the subject of musical effects Figure 3 is a demonstration drumbeat program — a little simple but it gives the general idea.

Note that the sound registers are *Poked* off as soon as they are turned on (line 30) Any delay between this sounds the drumbeat as a note One way to modify this program is to have the information concerning the drumbeats and delays in Data statements which would mean they could more easily be changed (at will, in fact) Get weaving

Finally, a word about envelope shaping When a note is played from the Vic it continues to play until you *Poke* the register with zero On the other hand a note from a piano decreases in volume (after peaking) Obviously to make the Vic sound like a piano we must make the volume decay accordingly (define the volume envelope) Try

```
10 POKE 36874 225 POKE 36875 243 POKE
   36876 225
20 FOR A = 1 TO 5 STEP 1 POKE 36878 A NEXT
30 FOR A = 15 TO 0 STEP .05 POKE 36878,A NEXT
```

Musical tunes are useful in games to introduce the players or as "rewards" for high scores

You may have noticed that in the first program the full three voices were used Although they enhance the sound, producing three voice harmonies on the Vic is very very difficult and boring Each note and pause must be written into data statements Yet the results can be stunning As an example, try

```
10 POKE 36878 15
20 READ A B C D:IF A<>0 THEN POKE 36876 A
30 POKE 36876 A POKE 36875 B POKE 36874 C
40 FOR E 1 TO D NEXT IF D=1 THEN END
50 GOTO 20
60 DATA 225 215, 195 720 0 215 195 0 225
   235 195 720 0 225 195 0 225 225 195 480
70 DATA 226 226 215 240
80 DATA 231 225 225 720 0 225 225 0 231
   225 225 460 225 228 215 240 231 225 225
   460
90 DATA 233 211 211 240
100 DATA 225 215 231 1450 240 240 225 720,
   235 215 231 720 231 225 225 720 225 215
   195 720
110 DATA 226 215 231 480 232, 183 183 240
   231 207 207 460 225 215 215 240 225 225
   225 960
120 DATA 0 0 0 1
```

Yes It's that old chestnut Well what did you expect — Mozart? Hmmm now there's a thought!

There are a couple of methods to allow music to be played directly from the keyboard of the Vic Page 75 of the Vic20 users manual is one example with the musical note values being stored in an array The Vic1211A super expander cartridge allows you to do the same by putting the machine into "music mode This also allows music to be played from within a *Print* statement The powerful *Sound* command makes the production of harmonies a much more pleasant prospect As well as this, the cartridge offers high resolution graphics with commands like *Paint Point, Draw, Circle* and *Color* and an extra 3K of memory Various *Read* commands for joysticks lightpens and paddles are also available ■

STOP PRESS Think you couldn't get high-resolution graphics on your Vic without buying a cartridge? Wrong Type in this program (carefully) then sit back and watch Be warned, though it uses a fairly long time

```
10 POKE 36879 8 POKE 36867 24 POKE
   36866 16 OR 128 POKE 36868 48
20 POKE 36864 18 POKE 36869 240 OR
   13 POKE 56,33
30 FOR A 0 TO 256 POKE 7680+A,A POKE
   38400+A 6 NEXT FOR A=5120 TO
   7160 POKE A,0 NEXT
40 FOR H 5 TO 1 STEP-1:FOR A=0 TO 13
   STEP 03 B=COS(A)*25+64
   C=SIN(A)*9*H+50
50 B%=B/8 C%=C/8 D=B% + C%*16 +
   7680 E=PEEK (D)
60 F= 5120 + E*8 + (C AND 7) POKE F PEEK
   (F) OR (2↑(7-(B AND 7)))
70 NEXT A,H POKE 36878 15:POKE 36876,230
```

Figure 1

```
10 C(0) = 207 C(1) = 215 C(2) = 231 C(3) =
   225 POKE 36878,15
20 FOR D = 1 TO 4
30 READ A POKE 36874,A
40 READ B POKE 36875,B
50 POKE 36876,C(INT(RND(1)*4))
60 READ C FOR S = 1 TO C NEXT
70 NEXT O RESTORE GOTO 20
80 DATA 195,207,250,207,0,120,209,0,
   300,207,195,120
```

Figure 2

```
10 POKE 36878,15 PRINT"[CLR]****
   SYNDRUMS (PMB)****"
20 FOR F = 1 TO 8 READ A(F) NEXT
30 DATA 201,212,223,235,239,240,
   245,250
40 GET A$:IF A$<>"" THEN V = 10
   N = VAL(A$) P = A(N):GOTO 60
50 IF P>0 THEN V= 1
60 P = P - V
70 IF P< = 170 THEN P = 0 V = 0
80 POKE 36876,P
90 GOTO 40
```

Figure 3

```
10 POKE 36878,15
20 FOR A = 1 TO 500 NEXT
30 FOR A = 1 TO 3 POKE 36877,200
   POKE 36874,200 POKE 36877,0
   POKE 36874,0
40 FOR B = 1 TO 20 NEXT B,A
50 FOR A = 1 TO 500 NEXT
60 POKE 36877,240 POKE 36874,240:
   POKE 36877,0 POKE 36874,0
   GOTO 20
```

The odd best-seller

***Dale McLoughlin** presents a simple word processor for the 48K Spectrum*

The Sinclair Spectrum does not readily lend itself to word processing applications, due really to the quality of its keyboard. However, it would still be useful to have a simple word processing program among one's software repertoire. It may help you to write the odd best-seller, or an article for your favourite computer magazine.

Here then is just such a program. It is written almost entirely in machine code, nearly 800 bytes in all, but do not be put off by the daunting task of entering all that hex — it will be well worth it when all is done. Of course, in less than 1K it is not possible to include all the user friendliness and versatility of a professional package, but the program is quite easy to use and much faster than anything written in Basic could ever be.

To enter the machine code, first type in program 1. When you run this, it will allow you to enter the hex in convenient blocks of any length, eg *0E* or *0E2A4B* etc. Program 1 *Pokes* the code into the top of memory, above Ramtop, which it moves for you, and overwriting the user defined graphics. You should *Save* the machine code immediately, to avoid any problems in case mistakes have been made. Use the command *Save "Wordproc" Code 64750,785*.

If you later find that there is an error (usually found by the system crashing), enter program 2 and run it to cross-check against the hex listing. When you find your mistake (or mistakes), make a note of the address and manually enter the correct data, remembering to convert the hex to decimal (appendix A of the Sinclair manual will help you do that). Since program 1 checks the total number of bytes entered, it should not be possible to leave something out without noticing. Note also that the first eight bytes are used to store variables and may be changed during the running of the *Wordproc* program.

Program 3 is the Basic part of the actual word processor. This should be entered, saved with *Save "Wordproc" Line 1* and then have the machine code bytes saved again immediately after it.

The machine code itself is divided into two main parts. There is an *Input* routine that uses the computer's own keyboard scanning program, which is called 50 times every second. The *Usr* routine simply looks to see which key was pressed last, if any, and then enters it into the appropriate position in the text. It recognises most of the single character symbols, ie *A-Z 0-9* and all the symbols obtained by the caps or symbol shift keys. You cannot, however, get into extended or graphics modes, but this should not be any great disadvantage.

The other main machine code routine prints the text, or an appropriate part of it, on to the screen. The text is held in a single dimension array (T$) which must be the first variable in the variables area of memory (hence the *Clear* statements in program 3). T$ can be of any length, but in practice the maximum is about 40,000 characters. This corresponds to roughly 6,500 words of normal English, perhaps 20 pages of a paperback book.

The position of the cursor is shown in T$ as a *Chr$0* and the end of text as *Chr$1*. These characters are not used in the Spectrum set so, if you *Print T$* as a Basic command after using the *Wordproc* program, they would show only as question marks. In fact, the whole of the array would look rather strange, because each line beginning throughout the text is shown as a character with 128 added to its usual code, thus a space becomes a graphics "Q".

On the display screen the cursor is shown by a flashing magenta square. The next character to be typed will appear in the position currently occupied by the cursor. The cursor can be moved within the text and new text can be added into any position. In any case, once more than 14 lines of text have been entered, the computer attempts to keep the cursor on line 15 of the screen, or thereabouts. When you have the program working, experiment with moving the cursor around and entering text; you will soon get the hang of it.

As I have already mentioned, all of the alpha-numerics and most of the other symbols can be accessed by the program. Unfortunately the capital shift lock does not work but this should not be a serious drawback. Other key functions are (all with caps shift except enter):

ENTER — moves cursor down to start a new line. When pressed in the middle of some text the next character pressed will move that line down to the next.

5 & 8 — cursor movement left and right, one space at a time throughout the whole text.

PROGRAM 1

```
10  DEF FN H$ (X) = CHR$ (48 + (INT (X/16)) + (7 AND INT (X/16) > 9)) +
    CHR$ (48 + (X - INT (X/16) * 16) + (7 AND X - INT (X/16) * 16 > 9))
20  FOR X = 64750 TO 65532 STEP 5 : PRINT X ,"    ";
30  FOR Y = X TO X + 4 : PRINT FN H$ ( PEEK Y ) ; " "; : NEXT Y
40  PRINT : NEXT X : STOP
```

PROGRAM 2

```
10  DEF FN H (X$) = 16 * ((CODE X$ ( 1 )) - ( 48 AND X$ ( 1 ) < "A" ) -
    ( 55 AND X$ (1 ) > "9" )) + ((CODE X$ (2 )) - ( 48 AND X$ ( 2 ) < "A" ) -
    ( 55 AND X$ ( 2 ) > "9 ")
20  CLEAR 64749 : LET X = 64750
30  INPUT X$ : IF X$ = "" THEN GO TO 30
35  IF X - INT ( X / 5 ) * 5 = 0 THEN PRINT   X ; "  ";
40  PRINT X$ ( TO 2 ) ; " " ; : POKE X , FN H ( X$ ( TO 2 )) : LET X = X + 1
50  IF X > 65532 THEN PRINT " END OF DATA " : STOP
60  IF X$ = "" THEN GO TO 30
70  GO TO 35
```

PROGRAM 3

```
10  CLEAR 64749 : LOAD "" CODE
20  CLEAR : DIM T$ ( 40000 ) : RANDOMIZE USR [illegible]
30  POKE 23560 , 255 : RANDOMIZE USR 64895 : [illegible]
40  PRINT AT 21 , 0 ; INK 1 ; " SAVE OR LOAD TEXT ? " : PAUSE 0
45  IF INKEY$ <> "" THEN GO TO 45
50  PAUSE 0 : IF INKEY$ = " S " OR INKEY$ = " s " THEN INPUT " FILE NAME ? " ;
    LINE X$ : SAVE X$ DATA T$ () : PRINT AT 21 , 0 ; INK 1 ; " TO VERIFY
    PRESS ANY KEY " : PAUSE 0 : VERIFY X$ DATA T$ ()
60  IF INKEY$ = " L " OR INKEY$ = " l " THEN CLEAR : LOAD "" DATA T$ () :
    RANDOMIZE USR 64484 : GO TO 30
70  CLS : PRINT AT 21 , 0 ; INK 1 ; " CLEAR TEXT ARRAY ? " : PAUSE 0 : IF
    INKEY$ <> " N " AND INKEY$ <> " n " THEN GO TO 20
80  GO TO 30
```

6 & 7 — cursor up and down. The cursor is always left at the end of a line. If you want to move along a line use shifted 5 or 8 as above. If the line is full of characters (even if there are only spaces at the end) the cursor will appear at the start of the next line but it will move sideways just the same with shifted 5 or 8.

0 — delete. Remember that it will delete the character immediately before the cursor. If the cursor is at the beginning of a line it will delete the last character of the line above and if it is at the second character of a line then that line may become part of the one above.

1 — breaks out of the machine code and returns to BASIC enabling you to Save or Load text or tape the program if necessary. When text is saved it is only the array T$ which is saved. In this way you could have a tape of the files with the main Wordproc program appearing only once at the beginning. Incidentally, because of the way the program uses memory it is not possible to check the file name when loading so be sure to have the tape in the right place first of all.

2 — enables you to make a copy of the screen to the printer. It does this by calling a routine in the ROM at address 3756 which carries out the COPY command. If you wish to print out a whole file you will have to juggle the text around and successively copy the screens. Unfortunately the Sinclair printer is not suitable for serious word processing applications.

Incidentally, the *Break* key is disabled, except after pressing caps shifted one, and the usual repeat function still works. There is also a short click, to let you know that a key has been pressed.

When you are adding characters into the middle of some existing text, you will notice that the computer responds much more slowly. This is because everything else in T$ must be moved up to make room for the new data and it is also necessary to completely reprint the whole screen after each key depression. It is all performed very fast, but the time difference is still noticeable. The same applies to delete.

The machine code stores a few bytes of information necessary for its operation in various places. The most noteworthy of these is in locations *23728-9* which are unused bytes in the system variables area of memory. These contain the address of the cursor in memory (actually somewhere within T$), so *Print Peek (Peek 23728 + 256 * Peek 23729)* should always give *0*. When T$ is *Loaded* from an existing file, a routine is called which finds the new location of the cursor and the other data which the program requires. The routine at *64758* is used when the program is first run, to set up those variables in the first place.

Finally, note that you can use any colours of *Ink* and *Paper* just by setting them with universal commands before running the program (or they could be added as, say, line 5). Only the cursor cannot be changed easily — I'm afraid you are stuck with the flashing magenta square. ■

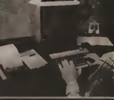
Continued on page 23

WORDPROC HEX LISTING

Address	Hex				
64750	00	00	00	00	00
64755	00	00	00	2A	4B
64760	5C	01	06	00	09
64765	22	80	5C	22	F4
64770	FC	22	F0	FC	36
64775	00	23	36	01	21
64780	B1	5C	36	80	C3
64785	7F	FD	3A	08	5C
64790	3C	28	FA	3D	FE
64795	07	CB	CD	08	FE
64800	CD	B6	FF	CD	A0
64805	FF	3A	81	5C	FE
64810	80	CC	7F	FD	18
64815	E3	FE	80	D0	D6
64820	20	F5	7B	E6	18
64825	F6	40	67	7B	E6
64830	07	0F	0F	0F	81
64835	6F	EB	F1	3C	3D
64840	28	17	ED	4B	36
64845	5C	04	26	00	6F
64850	29	29	29	09	06
64855	07	14	23	7E	12
64860	14	23	10	FA	C9
64865	06	07	14	EB	36
64870	00	24	10	FB	C9
64875	26	00	6B	29	29
64880	29	29	29	11	00
64885	58	19	06	00	09
64890	77	22	F2	FC	C9
64895	3A	8D	5C	2A	F2
64900	FC	77	01	00	00
64905	2A	F4	FC	7E	FE
64910	01	28	61	FE	00
64915	20	23	3A	81	5C
64920	FE	00	28	0C	3E
64925	00	B9	28	07	0E
64930	00	04	3E	16	B8
64935	CB	3E	88	E5	C5
64940	ED	43	EE	FC	CD
64945	6B	FD	C1	E1	23
64950	18	D4	FE	80	38
64955	1F	D6	80	08	3E
64960	00	B9	28	16	3E
64965	20	B9	28	0A	E5
64970	C5	CD	30	FD	C1
64975	E1	0C	18	F1	0E
64980	00	04	3E	16	B8
64985	CB	08	E5	C5	CD
64990	30	FD	C1	E1	23
64995	0C	3E	20	B9	20
65000	A3	0E	00	04	3E
65005	16	B8	20	9B	C9
65010	3E	20	B9	28	08
65015	C5	CD	30	FD	C1
65020	0C	18	F3	0E	00
65025	04	3E	16	B8	20
65030	EB	C9	21	0B	5C
65035	7E	FE	FF	C8	36
65040	FF	F5	21	32	00
65045	11	00	00	CD	B5
65050	03	F1	FE	20	30
65055	06	CD	A8	FE	C3
65060	7F	FD	21	81	5C
65065	86	36	00	2A	4B
65070	5C	23	23	23	23
65075	5E	23	56	19	ED
65080	4B	80	5C	03	A7
65085	ED	42	C8	FE	80
65090	38	04	ED	43	F0
65095	FC	ED	43	80	5C
65100	08	0A	FE	01	20
65105	35	08	60	69	2B
65110	77	23	36	00	23
65115	36	01	ED	4B	EE
65120	FC	C5	FE	80	38
65125	02	D6	80	CD	30
65130	FD	2A	F2	FC	3A
65135	8D	5C	77	23	36
65140	BB	22	F2	FC	C1
65145	0C	3E	20	B9	20
65150	03	0E	00	04	ED
65155	43	EE	FC	C9	08
65160	2A	4B	5C	23	23
65165	23	23	5E	23	56
65170	19	36	01	2B	E5
65175	0B	A7	ED	42	44
65180	4D	E1	54	5D	2B
65185	ED	B8	12	CD	7F
65190	FD	C9	FE	0D	20
65195	19	21	B1	5C	7E

65200	FE	80	20	0E	3E
65205	20	32	08	5C	CD
65210	08	FE	CD	7F	FD
65215	21	81	5C	36	B0
65220	C9	21	81	5C	36
65225	80	FE	0C	CA	51
65230	FF	FE	08	20	1A
65235	2A	4B	5C	01	06
65240	00	09	ED	4B	B0
65245	5C	A7	ED	42	C8
65250	60	69	2B	7E	36
65255	00	02	22	B0	5C
65260	C9	FE	09	20	10
65265	2A	B0	5C	23	7E
65270	FE	01	C8	22	B0
65275	5C	36	00	2B	77
65280	C9	FE	0A	20	20
65285	2A	B0	5C	54	5D
65290	23	7E	12	FE	01
65295	28	0D	54	5D	23
65300	7E	12	FE	01	28
65305	04	FE	80	38	F3
65310	2B	36	00	22	B0
65315	5C	C9	FE	0B	20
65320	22	2A	4B	5C	01
65325	06	00	09	44	4D
65330	2A	B0	5C	54	5D
65335	E5	A7	ED	42	E1
65340	28	07	2B	7E	12
65345	FE	80	38	F0	36
65350	00	22	B0	5C	C9
65355	FE	06	CA	AC	0E
65360	C9	2A	4B	5C	01

65365	06	00	09	ED	4B
65370	B0	5C	A7	ED	42
65375	C8	2A	4B	5C	23
65380	23	23	23	5E	23
65385	56	0B	ED	43	B0
65390	5C	03	19	A7	ED
65395	42	E5	60	69	C1
65400	54	5D	1B	ED	B0
65405	CD	6B	0D	3E	00
65410	32	81	5C	C9	2A
65415	B0	5C	ED	4B	F0
65420	FC	A7	ED	42	01
65425	1F	00	A7	ED	42
65430	C0	22	F0	FC	21
65435	81	5C	36	80	C9
65440	2A	F4	FC	E5	2A
65445	4B	5C	01	06	00
65450	09	E8	06	0F	3E
65455	80	2A	B0	5C	23
65460	2B	E5	A7	ED	52
65465	E1	2B	05	BE	30
65470	F5	10	F3	22	F4
65475	FC	D1	A7	ED	52
65480	C2	7F	FD	C9	2A
65485	4B	5C	23	23	23
65490	23	4E	23	46	23
65495	3E	00	ED	B1	2B
65500	22	B0	5C	CD	A0
65505	FF	2A	B0	5C	ED
65510	4B	F4	FC	A7	ED
65515	42	28	09	3E	80
65520	2A	B0	5C	2B	BE
65525	30	FC	22	F0	FC
65530	C3	7F	FD		



Blow-up

***Lee Allan** explains how to blow up the 64-character set to eight times normal size*

This short program enables the character set to be displayed at normal and eight times normal size. Also the Rom location and decimal number associated with each pixel row is shown.

The program works by identifying the location in the Rom character set of a character typed in at the keyboard. The eight bytes holding the character shape are read from the character set and the bit pattern translated into eight rows of eight full character positions on the screen. A reverse space character is used to represent a pixel set, a normal space for a pixel not set.

The screen thus displays the exact arrangement of pixels as used in the formation of the normal size character. The screen also displays the memory location of each of the eight bytes used for the character and the values stored in those locations. All the character set is available, including all upper and lower case alpha-numerics and graphics, plus all reverse video forms. The mode in which the program is currently working is selected by the use of the four function keys:

F1 — Upper case selected
F3 — Lower case selected
F5 — Normal video on
F7 — Reverse video on

Invalid entries from the keyboard, eg, 'return' 'inst/del' etc, are error trapped.

The Rem statements contained in the program listing should enable the workings to be understood — if not, here is a brief functional listing:

2	Clears screen to black with black border
4	Memory pointers
6-40	Graphics for title page
42	2½ sec delay
44	Clear screen and change colour
48-62	Set up screen
64-78	Check for keyboard entry
80	Turn off keyscan interrupt/switch in character
82	Read character set into Ram
84	Switch in I/O restart keyscan interrupt
86 88	Print character address value
100-110	Upper case sub routine
200 210	Lower case sub-routine
300 310	Normal video sub-routine
400-410	Reverse video sub-routine
500 510	Erase character address/value
600-610	Error trapping routine

Variables

I	Character shape pointer
J	Character pixel pointer
T	Delay loop counter
CH	Poke code of K$
CR	Reverse character offset
CS	Character start location
CT	Character video screen location
CO	Character colour screen location
MX	Reference in VAL calculation
VL	Value in each address for character shape
K$	Keyboard entry
KK$	Keyboard memory

Note

The rate of character printing may be increased by rearranging line 84 thus:

```
84 NEXT PRINTLEFT$(A$ 7 + I)
      PEEK(12288 + I) NEXT
```

```
1 REM **** CLEAR SCREEN/COLOUR BLACK ****
2 PRINT"" POKE53280,0 POKE53281,0
4 POKE52,48 POKE56,48 CLR
5 REM **** CTRL P ****
6 PRINTTAB(17)""TAB(28)""
7 REM **** CTRL 2 ****
8 PRINTTAB(16)""TAB(27)""
9 REM **** CTRL 4 ****
10 PRINTTAB(15)""TAB(26)""
11 REM **** CTRL 5 ****
12 PRINTTAB(14)""TAB(25)""
13 REM **** CTRL 6 ****
14 PRINTTAB(13)""TAB(24)""
15 REM **** CTRL 2 ****
16 PRINTTAB(12)""TAB(23)""
17 REM **** LOGO 1 ****
18 PRINTTAB(11)""TAB(22)""
19 REM **** LOGO 3 ****
20 PRINTTAB(10)""TAB(21)""
21 REM **** LOGO 6 ****
22 PRINTTAB(10)""TAB(20)""
23 REM **** LOGO 5 ****
24 PRINTTAB(10)""TAB(20)""
25 REM **** LOGO 7 ****
26 PRINTTAB(11)""TAB(28)""
27 REM **** LOGO 8 ****
28 PRINTTAB(12)""TAB(28)""
29 REM **** BLOW UP/LOGO 1 ****
30 PRINT""
32 PRINT""
34 PRINT""
36 PRINT""
38 PRINT""
40 PRINT""
42 FORT=1TO2500 NEXT
43 REM **** CLEAR SCREEN/CHANGE COLOUR ****
44 PRINTCHR$(147) POKE53280 13 POKE53281,15
46 A$=""
47 REM **** SET UP SCREEN ****
48 PRINTLEFT$(A$,4)TAB(7)"BITS SET"TAB(22)"ADDRS"TAB(32)"VAL"
50 PRINTTAB(7)"76543210"
52 PRINTTAB(6)"
```

Continued over the page

```
54 FORX=0TO7 PRINTTAB(6)"  "TAB(15)" " NEXT
56 PRINTTAB(6)"
58 GOSUB100 GOSUB300
60 PRINTLEFT$(A$,18)TAB(9)"
62 PRINTLEFT$(A$,24)TAB(11)"*** HIT ANY KEY ***"
63 REM **** SCAN KEYBOARD ****
64 GETK$ IFK$=""THENCT=1231 CO=CT+54272 GOTO64
66 IFK$=" "THENGOSUB500 GOSUB100 GOTO76
68 IFK$=" "THENGOSUB500 GOSUB200 GOTO76
70 IFK$=" "THENGOSUB500 GOSUB300 GOTO76
72 IFK$=" "THENGOSUB500 GOSUB400 GOTO76
74 PRINT" ";K$ CH=PEEK(1024) KK$=K$ GOSUB500
76 IFKK$=""THEN64
78 IFK$<>" "ANDCH=32THENGOSUB600 GOTO64
79 REM **** WRITE DATA FROM ROM INTO RAM STARTING AT 12288 ****
80 POKE56334,PEEK(56334)AND254 POKE1,PEEK(1)AND251
82 FORI=0TO7 POKE12288+I,PEEK(CS+CR+CH*8+I) NEXT
84 POKE1,PEEK(1)OR4 POKE56334,PEEK(56334)OR1
85 REM **** PRINT CHARACTER/ADDRS/VAL ****
86 FORI=0TO7 VL=PEEK(12288+I) MX=128 CT=CT+40 CO=CO+40
88 FORJ=0TO7 IFVL<MXTHEN92
90 POKECT+J,160 POKECO+J,0 VL=VL-MX
92 MX=MX/2
94 PRINTLEFT$(A$,7+I)TAB(21)" "CS+CR+CH*8+ITAB(31)" "PEEK(12288+I) NEXT NEXT
96 PRINT" " PRINTLEFT$(A$,19)TAB(10)CR$KK$
98 POKE198,0 GOTO64
93 REM **** UPPER CASE ****
100 PRINTLEFT$(A$,18)TAB(18)"UPPER CASE SELECTED" CS=53248
102 POKE53272,21
110 RETURN
199 REM **** LOWER CASE ****
200 PRINTLEFT$(A$,18)TAB(18)"LOWER CASE SELECTED" CS=55296
202 POKE53272,23
210 RETURN
299 REM **** NORMAL CHARACTERS ****
300 PRINTLEFT$(A$,20)TAB(19)"NORMAL VIDEO ON " CR=0 CR$=" "
310 RETURN
399 REM **** REVERSE CHARACTERS ****
400 PRINTLEFT$(A$,20)TAB(19)"REVERSE VIDEO ON" CR=1024 CR$=" "
410 RETURN
499 REM **** ERASE CHARACTER/ADDRS/VAL ****
500 FORI=0TO7
502 PRINTLEFT$(A$,7+I)TAB(7)"        "TAB(22)"     "TAB(32)"   "
504 NEXT
506 PRINTLEFT$(A$,19)TAB(10)" "
510 RETURN
599 REM **** ERROR ****
600 PRINTLEFT$(A$,22)TAB(3)"ERROR   NOT A PRINTABLE CHARACTER"
602 FORT=1TO1000 NEXT
604 PRINTLEFT$(A$,22)"                                     "
610 RETURN
700 REM **************************
702 REM **************************
704 REM ****                  ****
706 REM ****  CBM 64 BLOW UP  ****
708 REM ****    LES  ALLAN    ****
710 REM ****  17TH JUNE 1983  ****
712 REM ****                  ****
714 REM **************************
716 REM **************************
718 REM ****                  ****
720 REM **** VIC 1515 PRINTER ****
722 REM **** VIC COLOURS ONLY ****
724 REM ****                  ****
726 REM **************************
728 REM **************************
```

HERE COMES HORACE!

Just when you thought microcomputer games had nothing more to offer, here comes Horace!

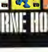
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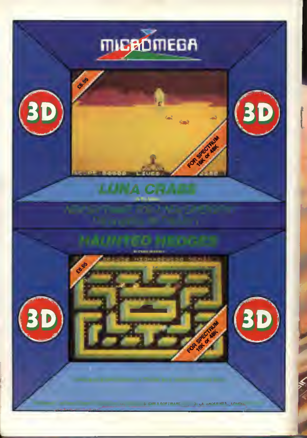
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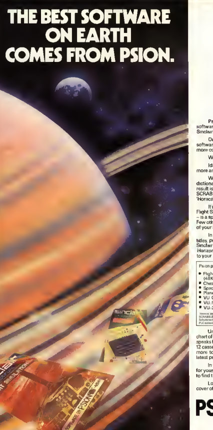
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Letters of credit

***Andrew Homer** explains how to generate simple video titles using a micro*

The production of suitable titles and credits for video recordings produced with simple camera systems, can cause something of a problem The excellent results produced by modern video cameras and recorders are often spoilt by the lack of effective titles and credits

At Dudley College of Technology we have in the past made use of dry transfer lettering sheets which are, unfortunately, both time consuming and expensive However it is possible to produce effective titles directly on to video tape quickly and inexpensively without the use of a video camera

Effective titles have been produced at Dudley by using a BBC microcomputer (model A or B) as a character generator and coupling it directly into a VHS video recorder Any computer with UHF or Video output sockets could be used for this purpose although the BBC machines offer large size characters in Mode 5 and a video output socket A typical program to produce simple video titles on a BBC machine is shown in Example 1

Example 1
Program notes

Line

10	Selects the MODE Selecting a MODE also clears the screen
20	Removes the flashing cursor from the display in any MODE. Without this line the cursor would be present throughout the recording
30	Waits for a character key to be pressed before carrying on to the next statement
40	Prints the title on the screen Spaces between words can be increased if necessary to balance the text Horizontal position is determined by the number in brackets after the TAB statement The number represents character spaces across the screen Vertical position is determined by the apostrophe marks after the PRINT statement Each apostrophe moves the title one line down the screen TAB (X,Y) could be used in place of the apostrophe as shown in Example 2
50	As line 30
60	Clears the screen
70	As line 30
80	Ends the program

When the program is Run a completely blank screen appears Touching a character key brings up the first title Touching the key again produces another blank screen The program is ended by again touching

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COMPUTER VIDEO RECORDER

Figure 1

the key Although very simple a series of effective titles can be generated frame by frame as shown in Example 2 A squared grid, printed on paper corresponding to the screen display, is useful if a number of frames are to be produced Best results are usually obtained by having a blank screen at the beginning and end of the sequence

In order to record the titles on to video tape the computer must be coupled directly into the video recorder The BBC machines in common with many other systems have both UHF and video output sockets For best results, the video output socket on the computer should be connected to the video input socket on the video recorder with a suitable lead

Unfortunately the video output connection on the BBC machine unless modified, gives a black and white picture However, for simple titles consisting of white letters on a black background the improved picture quality obtainable through this connection makes its use well worthwhile

If the UHF socket is to be used it should be connected to the aerial input socket on the video recorder with the lead supplied with the computer This connection will require a spare channel on the video recorder to be tuned in to the output signal from the computer

Whichever connection is used, a UHF television receiver must be connected and tuned to the output from the video recorder in the normal way If connected properly the computer's visual display should appear on the television screen The equipment should be connected as shown in Figure 1

Titles stored in the computer as print statements can then be recorded on to video tape as required Cassette or disc storage can of course be employed if the titles are likely to be needed again Computer generated titles should not be recorded on to the front of existing programmes as severe disturbances can occur when the picture changes from titles to program content In order to avoid such disturbances the following sequence should be employed

(1) Record the opening titles (computer)
(2) Record the program content (video camera or second recorder)
(3) Record the closing credits (computer)

If a video recorder with insert editing facility is available computer generated titles can be inserted at any point in an existing program Music can be used with the title and credit sequences by connecting a cassette recorder to the audio input socket of the video recorder

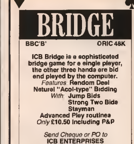
Although the production of very simple titles and credits has been described here, there is obviously plenty of scope for more ambitious graphics, such as larger size letters if required The titles and credits produced by this simple method have proved to be extremely effective when used with our own two-camera video system ■

Example 1

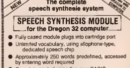
```
10 MODE 5
20 VDU 23;8202;0;0;0;
30 X=GET
40 PRINT''''''TAB(3);"TITLES PROGRAM"
50 X=GET
60 CLS
70 X=GET
80 END
```

Example 2

```
10 MODE 5
20 VDU 23;8202;0;0;0;
30 X=GET
40 PRINT TAB(4,9);"DEMONSTRATION"
50 PRINT TAB(3,12);"TITLES  PROGRAM"
60 PRINT TAB(6,19);"A.J.HOMER"
70 X=GET
80 CLS
90 PRINT TAB(7,13);"THE END"
100 X=GET
110 CLS
120 X=GET
130 END
```


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Angling for a line

Ian Barkar *presents a simple 3D graphics program for the Dragon 32*

The Dragon's *Draw* command is easy to use but it is also very limited. This program is based on the Draw command — it allows you to draw lines to *Pmode 4* at any angle (to vertical) and of any length.

Constructing irregular shapes requires the calculation of the cartesian co-ordinates of each line's end points. This program calculates these x y co-ordinates for a given set of polar co-ordinates (*R, A1* and *A2*). *R* is the length of the line and *A1* its angle (in degrees) to the vertical (*X*) axis. 3D drawings can be achieved by entering positive or negative angles for *A2*.

Instructions and the *x, y, z* axes are presented at the beginning of the program — the axes and associated polar co-ordinates (*R, A1* and *A2*) are also shown in Figure 1.

The program is controlled by the user with the variable *C*. Initially the starting point of the drawing will have to be entered *x1* and *y1*. This can be done by entering *C=1* and then *x1* and *y1* (*x1=0–255* and *y1=0–192*). The length of line and its angle(s) are then entered. A quick view of the hi-res screen is given while printing out the values of *x1 y1, x2* and *y2* where (*x1 y1*) and (*x2 y2*) are the ends of the line.

The program then asks for the next line's *C* value — if *C=0* then the next line continues from the end of the first line. If *C=2* is entered, the drawing is shown until the spacebar is pressed to return to the program. *C=1* is used to move the drawing position of point (*x1 y1*) of the next line in a similar manner to the *Draw* command's blank move.

The accompanying table gives some values for the variables *C, R, A1, A2, x1* and *y1*, used to draw a regular hexagon. It may be noted that this figure is impossible to draw using the *Draw* command. ■

LINE NU	C	R	A1	A2	X1	Y1
1	1	70	0	0	125	96
2	0	70	60	0	—	—
3	0	70	120	0	—	—
4	0	70	180	0	—	—
5	0	70	240	0	—	—
6	0	70	300	0	—	—

Notes

Enter each line (1-6) before proceeding to the next one
X1 and *Y1* are entered for line 1 only. These are entered when c is 1
R is length of line in pixels
A1 and *A2* are the angles of the line to the vertical and horizontal axes respectively (*Y* and *X* axes)
Return can be used whenever 0 is the value entered, thus speeding up entry of the parameters considerably
The hexagon can be made to appear to turn out of the plane of the screen by entering positive or negative values for *A2* whilst keeping *R* and *A1* the same

Figure 1

Formulae used in program
X2 = Rxsin(A1)xcos(A2)
Y2 = Rxcos(A1)
Y
X2,Y2
R
A1
X1 Y1
A2
X
Z

The relationship between the X,Y axes and the Polar co-ordinates R A1 A2

```
10 REM* 3-D GRAPHICS*
20 REM*BY I K BARKER
30 REM MAY 1983
40 CLS PRINT"A UTILITY P
ROGRAM BY I K BARKER"
50 PRINT"                NA
Y 88"
60 PRINT
70 LINEINPUT"ARE INSTRUC
TIONS REQUIRED(Y/N)?" A$
80 IF A$<>"Y"ANDA$<>"N"
THEN70
90 IFA$="Y"THEN GOSUB 45
0
100 PCLS
110 REM*DRAWING ROUTINE*
120 PMODE4 1
130 PRINT
140 PRINT"C=0    TO CONTI
NUE DRAWING FROM
POINT"X2" "Y2
150 PRINT"C=1    TO DRAW
LINE FROM A NEW
POINT(X1 Y1)"
160 PRINT"C=2    TO VIEW
SCREEN                (P
RESS SPACEBAR TO CONTINU
E)"
170 PRINT"       INPUT VA
LUE OF C FOR
LINE"S+1 INPUTC
180 IFC<0ORC>2 THEN120
190 ON C GOTO 210 440
200 X1=X2 Y1=Y2 GOTO220
210 INPUT" INPUT NEXT PO
INT  X1 Y1 " X1 Y1
220 INPUT"INPUT POLAR CO
-ORDS  R A1 &A2",R,A1 A2
230 A1=180-A1
240 A1=A1*ATN(1 0)/45
250 A2=A2*ATN(1 0)/45
260 X2=R*SIN(A1)*COS(A2)
+X1
270 Y2=R*COS(A1)+Y1
280 D=X2-FIX(X2) D1=Y2-F
IX(Y2)
290 IFD>= 445THENX2=FIX(
X2)+1ELSEX2=FIX(X2)
300 IFD1>= 445THENY2=FIX(
Y2)+1ELSEY2=FIX(Y2)
310 IFX1<0ORX1>256 THEN4
70
320 IFX2<0ORX2>256THEN47
0
330 IFY1<0ORY1>192THEN47
0
340 IFY2<0ORY2>192THEN47
0
350 LINE(X1,Y1)-(X2 Y2),
PSET
360 IFS=0THENPRINT@-2 "L
INE  (X1,Y1)-(X2,Y2)"
370 PRINT"        LINE(X1
Y1)-(X2 Y2)"
380 S=S+1 PRINT"NU"S"("X
1" "Y1")-("X2" "Y2")"
390 PRINT
400 PRINT@-2 S""X1;Y1"-"
X2 Y2
410 SCREEN1,0
420 FORQ=1TO1500 NEXT
430 GOTO110
440 SCREEN1,0
450 IF INKEY$=" "THEN110
460 GOTO450
470 PRINT"OUT OF RANGE "
 "X1="X1,"X2="X2,"Y1"Y1
 "Y2="Y2 PRINT
480 X2=X1 Y2=Y1 PRINT"RE
-ENTER" GOTO110
490 REM**INSTRUCTIONS FO
R MAIN PROGRAM**
500 CLS PRINT@32 "INSTRU
CTIONS",
510 PRINT@60,"press spac
ebar TO VIEW THE AXES AN
D POLAR COORDINATES R A1
 & A2 ALSO press spaceba
r TO RETURN TO TEXT  pres
s d TO START DRAWING "
520 PRINT@227,"C=0 1 OR
2 CONTROLS THE MAIN
  PROGRAM"
530 PRINT@291,"R=LENGTH
OF LINE IN PIXELS"
540 PRINT@355 "A1=ANGLE
OF LINE IN DEGREES
  FROM VERTICAL AXIS"
550 PRINT@451 "A2=ANGLE
OF LINE IN DEGREES
  FROM HORIZONTAL AXIS"
560 IF INKEY$=" " THEN59
0
570 IF INKEY$="D"THEN RE
TURN
580 GOTO 560
590 REM*THE AXES DRAWN*
*
600 PMODE3 1 PCLS SCREEN
1 0
610 DRAW"S6"
620 DRAW"BM100 96 C4NU70
ND100NG55"
630 DRAW"C2E40C3G81NH44E
44BM100 24 R2D2R2D2R2D3R
10M121 36 D2L2D2L2D2L2D2
L2"
640 DRAW"BM98 20F4U5NH3E
3"
650 DRAW"BM240 90NE6BM+6
 +6 H6"
660 DRAW"BM10,162NR8UE6U
L6"
670 DRAW"C2BM125 47U8R4F
D2G2L3F4"
680 DRAW"BM107,70U4NR3U3
R4D7BM+4 +0U7"
690 DRAW"BM124 114 U4NR3
U3R4D7BM+3 +0 NR4E4UH2L0
GD"
700 DRAW"BM176 90 E4BM+0
 +4 H4F4BM+6 +0 L3E3H2GD
"
710 DRAW"BM+6 +4 U2E2"
720 DRAW"BM+4 -1 U3NH2E2
"
730 DRAW"BM+7 +5 L3E3H2G
D"
740 DRAW"BM55 180 E4 BM+
0,+4 NH4 BM+4,+0 NU4 BR4
 NG4BR4 U0NH2E2,BM+3 +4,
U4"
750 IF INKEY$=" " THEN
500
760 GOTO 750
```

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the _Program of the Week_ double our new fee of £6 for each program published.

Balloons

on Spectrum

This is an amusing game for either machine. The game starts with a small introduction, a balloon rising up to a dart and bursting.

The introduction also shows you the control keys, and tells you that by pressing two keys at once you can move diagonally. This is done by using the function *In* to control movement. The *Border* and *Paper* colours are *Poked* in, rather than entered from *Basic* to avoid any risk of interfering with *In* (lines 40-50).

The object of the game is to steer a dart so that it bursts the balloon which appears in random positions on the screen and to do so in the shortest time possible. To make things harder every so often the balloon shifts to a new position. At the end of the game the Spectrum will give you a report on how well you played. Do not be offended if it is rube to you at first, you will soon get better.

If you find the game too hard you can change line 720 to read

```
720 IF a/30 <> INT(a/30) THEN GO TO 390
```

My high score is 100

Variables

high = high score
p = vertical co-ordinate for dart
p1 = horizontal co-ordinate for dart
p2 = vertical co-ordinate to delete dart
p3 = horizontal co-ordinate to delete dart
a$ = dart
lives = time/25
a = time counter
b = vertical co-ordinate for balloon
c = horizontal co-ordinate for balloon
r$ = report

Graphics

Line 210 — graphic E
Line 220 — graphic A
Line 250 — graphic C E D B
Line 480 — graphic I
Line 490 — graphic H
Line 500 — graphic G
Line 510 — graphic F

```
  10 REM Balloon © R.Smith
  20
  30 LET high=0
  40 POKE 23624,40
  50 POKE 23693,40
  60 INK 2: CLS
  70
  80 REM user graphics
  90
 100 DATA 60,110,94,126,126,60,0
,8
 110 DATA 0,128,76,255,76,128,0,
0,0,1,50,255,50,1,0,0
 120 DATA 8,8,28,28,8,0,28,42,42
,28,8,8,28,28,8,8
 130 DATA 128,64,56,56,59,4,10,8
,16,80,32,220,28,28,2,1
 140 DATA 1,2,28,28,220,32,80,16
,8,10,4,59,56,56,64,128
 150 RESTORE 60: FOR n=0 TO 71
 160 READ c: POKE USR "a"+n,c
 170 NEXT n
 180
 190 REM intro
 200
 210 PRINT AT 0,7; INK 2; PAPER
6; FLASH 1;"BURST THE BALLOON":
PRINT INK 1;AT 2,15;"↑"
 220 FOR n=21 TO 3 STEP -1: PRIN
T AT n,15; INK 4;"●": BEEP .1,20
-(n*.1): PRINT AT n,15;" ": NEXT
 n: BEEP .1,-30: PAUSE 11
 230 INK 4: PRINT AT n+1,14;"\|/
",AT n+2,14;"- -",AT n+3,14;"/|\
"
 240 INK 2: PAUSE 11: CLS
 250 PRINT AT 0,8;"C O N T R O L
S",AT 2,10;"←  ↑  ↓  →",AT 3,10
;"1  2  3  4",AT 21,8;"Any key t
o play"
 260 PRINT AT 5,0;"To move diago
nally press 2 keys": PAUSE 0
 270
 280 REM game start
 290
 300 CLS
 310 LET lives=5
 320 LET a$="↑"
 330 LET score=0
 340 LET a=0
 350 LET p=5: LET p1=5
 360 LET p2=p: LET p3=p1
 370 LET b=INT (RND*20)+1
 380 LET c=INT (RND*30)+1
 390 IF POINT (0,10)=0 THEN INK
0: DRAW 255,0: DRAW 0,175: DRAW
-255,0: DRAW 0,-175: INK 2
 400 IF lives=1 THEN GO TO 770
 410 PRINT AT b,c; INK 4;"●"
 420 IF score>high THEN LET high
=score
 430
 440 REM move dart
 450
 460 LET p=p+(IN 63486=253 AND p
<20)-(IN 63486=251 AND p>1)
 470 LET p1=p1+(IN 63486=247 AND
p1<30)-(IN 63486=254 AND p1>1)
 480 IF IN 63486=252 THEN IF p<2
0 THEN IF p1>1 THEN LET p=p+1: L
ET p1=p1-1: LET a$="↙"
 490 IF IN 63486=243 THEN IF p>1
 THEN IF p1<30 THEN LET p=p-1: L
ET p1=p1+1: LET a$="↗"
 500 IF IN 63486=245 THEN IF p<2
0 THEN IF p1<30 THEN LET p=p+1:
LET p1=p1+1: LET a$="↘"
 510 IF IN 63486=250 THEN IF p>1
 THEN IF p1>1 THEN LET p=p-1: LE
T p1=p1-1: LET a$="↖"
 520 IF INKEY$="1" THEN LET a$="
←"
 530 IF INKEY$="4" THEN LET a$="
→"
 540 IF INKEY$="2" THEN LET a$="
↑"
 550 IF INKEY$="3" THEN LET a$="
↓"
 560 PRINT AT p,p1; INK 1;a$
 570 IF p2<>p OR p3<>p1 THEN PRI
NT AT p2,p3;" "
 580
 590 REM burst balloon
 600
 610 IF p=b AND p1=c THEN LET sc
ore=score+10: BEEP .1,-30: PRINT
 AT b-1,c-1; INK 4;"\|/",AT b,c-
1;"- -",AT b+1,c-1;"/|\": CLS :
GO TO 370
 620 IF p<>b OR p1<>c THEN
 630
 640 REM scoring
 650
 660 PRINT AT 21,23;"HIGH=";high
,AT 21,0;"TIME=";a,AT 21,12;"1UP
=";score,AT 0,7;"BURST THE BALLO
ON"
 670 LET a=a+1
 680 IF p<>p2 OR p1<>p3 THEN PRI
NT AT p,p1;" "
 690
 700 REM timer
 710
 720 IF a/25<>INT (a/25) THEN GO
TO 390
 730 LET lives=lives-1: CLS : GO
TO 370
 750 REM dead
 760
 770 IF lives=1 THEN LET r$="":
LET r$=("Terrible! " AND score<5
0)+("Well done! " AND score>=50)
+("Brilliant! " AND score>=70)+(
"Amazing! " AND score>=100)
 780 IF lives=1 THEN PRINT AT 10
,INT ((31-LEN r$)/2);r$,AT 21,0;"T
IME=100",AT 21,12;"1UP=";score,A
T 21,23;"HIGH=";high,AT 11,7;"A=
another, S=stop": IF r$="" THEN
LET r$="Very good.": GO TO 780
 790 IF lives=1 THEN IF INKEY$="
s" THEN POKE 23693,56: POKE 2362
4,56: CLS : STOP
 800 IF INKEY$="a" THEN GO TO 40
 810 IF lives=1 THEN GO TO 790
```

Balloons
by R Smith


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Alien Maza

on Vic20

Realising that all your friends have been eliminated it is your duty to revenge their deaths What was it that massacred the whole crew (except you the last survivor)? Are you to be destroyed like the rest? Are you doomed to die?

The biggest space villain of them all has planted a bomb on your ship no ordinary bomb though It's the latest technology a homing bomb and once it's locked on to your position you've had it.

Locked in the engine room, you must avoid this new weapon and reach the flashing cross, then press space for another life. but hurry — it may disappear suddenly

The controls are, *A* — up *Z* — down *X* — left *C* — right and space bar to jump the bomb and get an extra man when under the flashing cross Random missiles also travel across the screen adding to your troubles

Program notes

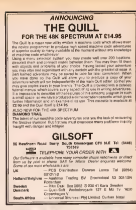
0	subroutine to set variables and screen
1-13	m/c data for ladders
18-26	random missile
27-32	sound effects of missile
36-70	moves man
125-240	checks missile and prints cross
220-360	moves homing bomb
3000	routine to end
2100 2560	set variables and screen
3000-3006	checks man's position If bomb's half of screen then homing bomb goes down ladders if above then homing bomb goes up ladders
3100-3121	bonus man
3210 3240	blowing up procedure
3350-3380	no man left blowing up procedure. scrolls screen
4000-4096	set up screen

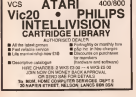
```
0 GOSUB2100
1 N=820
2 READD IFD=-1THENGOTO18
3 POKEN,D N=N+1 GOTO2
4 DATA169,107,162 0,157,70,30,157,92,30,157,114,30,157,136,30,157,158,30,162,15
4
5 DATA157,15,30,157,37,30,157,59,30,157,81,30,157,103,30,157,96,30,157 110,30
6 DATA157,140,30,157,162,30,157,184,30,157,189,30,157,211,30,157,233,30,157,255
30
7 DATA162,255,157,176,30,169,64,162,0,157,71,30,157,93,30,157,115,30,157,137,30
8 DATA157,159,30,157,170,30 157,192,30,157,214,30,157,236,30,162,176,157,82,30
9 DATA157,75,30,157,97,30,157,119 30,157,141,30,157,163,30,157,168,30,157,190,3
0
10 DATA157,212,30,157,234,30,162,255,157,177,30,162,0 169,115,157,72,30,157,94,
30
11 DATA157 116,30,157,138,30,157,160,30,157,171,30,157,193,30,157,215,30,157,23
7,30
12 DATA162,176,157,83,30,157,76,30,157,98,30,157,120,30,157,142,30,157,164,30,1
57,169,30
13 DATA157,191 30,157,213,30,157,235,30,162,255,96,-1
18 POKESS,32 POKES1,15 S=250 V=15 A=INT(RND(1)*6) IFAU=1THENA=6
19 IFAU=2THENA=2 IFA=2THENQ=7010 AU=0
20 IFA=3THENQ=7898 SS=7801
21 IFA=4THENQ=7986 SS=7889
22 IFA=5THENQ=8074
23 IFA=6THENQ=7766 P=100 AU=0 SS=7713
25 IFPEEK(Q-1)<>102THENPOKEQ P POKEQ-1,31 Q=Q-1 GOTO27
26 POKEQ,P POKEQ+19,31 P=32 GOTO18
27 POKE36877,S POKE8113,115
30 IFPEEK(Q)=PEEK(Z)THENGOSUB3210
32 SYS820 POKEZ,65 POKEA1,81 POKESS,43
36 BU=PEEK(197) LL=PEEK(Z-1) MR=PEEK(Z+1)
40 IFBU=26ANDLL<>102ANDPEEK(Z-2)<>113ANDPEEK(Z-2)<>32THENPOKEZ,100 POKEZ-1,65 Z
=Z-1
42 IFPEEK(Z)=PEEK(A1)THENGOSUB3210
45 IFZ<8076THENGOTO50
47 IFPEEK(Z-5)=PEEK(DP)THENPOKEDP-22,32 POKEDP,76 GOTO50
48 IFPEEK(Z-3)=PEEK(DP)THENPOKEDP,100 POKEDP-22,101 GOTO50
49 IFPEEK(Z+1)=PEEK(DP)THENPOKEDP-22,32 POKEDP,76
50 IFBU=34ANDMR<>102ANDPEEK(Z+2)<>113ANDPEEK(Z+2)<>32THENPOKEZ,100 POKEZ+1,65 Z
=Z+1
52 IFPEEK(Z)=PEEK(A1)THENGOSUB3210
55 IFBU=32ANDPEEK(Z-44)ANDPEEK(Z-22)=32THENPOKEZ,100 POKEZ-22,65 Z=Z-22
57 IFPEEK(Z-22)=43THENGOSUB3100
58 IFBU=17ANDPEEK(Z-22)=64THENPOKEZ,64 POKEZ-22,65 Z=Z-22
65 IFZ<7850THENAU=2
66 IFZ>7920THENAU=1
70 IFBU=33ANDPEEK(Z+22)=64THENPOKEZ 64 POKEZ+22,65 Z=Z+22
125 IFPEEK(Q-1)<>102THENPOKEQ P POKEQ-1,31 Q=Q-1 GOTO220
130 POKEQ,P POKEQ+19,31 P=32 GOTO18
```

```
220 POKES3,91 POKES1,S-1 POKES2,V V=V-1 POKEA1,100 POKEA1+D1,81 A1=A1+D1
260 IFPEEK(A1+22)=64ORPEEK(A1+22)=65THENGOSUB3057
280 IFPEEK(A1+D1)=102THEND1=-D1
300 IFPEEK(A1-22)=32ANDD1=-22THENKL=0 GOSUB3000
310 IFPEEK(A1+22)=113ANDD1=22THENGOSUB3000
315 IFKL=1THENGOTO340
320 IFPEEK(A1-21)=115THENGOSUB3050
340 IFPEEK(A1)=PEEK(DP)THENPOKEA1,100 A1=7766 I1=-1
350 IFPEEK(Z)=PEEK(A1)THENGOSUB3210
360 IFME=0THENGOTO2000
370 IFPEEK(Z)=PEEK(Q)THENGOSUB3210
380 IFPEEK(Z+22)=100THENPOKEZ,32 POKEZ+22,65 Z=Z+22
390 IFPEEK(A1-2)=PEEK(Z)THEND1=-1
400 IFPEEK(A1+2)=PEEK(Z)THEND1=1
1990 POKES3,86 GOTO25
2000 GOTO3050
2100 GOSUB4000 PRINT"♥" A1=7756 D1=-1 S1=36877 S2=36878 ME=3 ML=8144 S3=36876 S
S=7713
2101 DD=76 DP=8101 POKE8077,99 FORI=8142TO8185 POKEI,102 NEXTI
2110 POKE8078,77 POKEML,193 POKEML-1,193
2120 M=7680 Z=8099 Q=8074 POKE7810,31 POKE7899,31 POKE7986,31 F=32
2130 POKE8074,31 FORI=1TO6 FORK=MTOM+21 POKEK,113 POKEK-22,100 NEXT M=M+88 NEXT
I
2140 FORI=7680TO8164STEP22 POKEI,102 POKEI+21,102 NEXTI S=200
2500 RETURN
3000 IFZ<A1THEND1=-1
3028 IFZ>A1THEND1=1
3029 IFZ<A1-20THEND1=1
3030 RETURN
3050 IFZ<A1-20THEND1=-22 KL=1 RETURN
3055 RETURN
3057 IFZ>A1+20THEND1=22 RETURN
3060 RETURN
3100 POKEZ,32 Z=8099 POKES1,0 FORD=1TO11 L=220 J=20 FORI=1TO8 POKES3,L L=J-2
3120 FORK=1TO1 NEXTK NEXT NEXTD
3121 ME=ME+1 ML=ML+1 POKEML,190 POKES3,0 RETURN
3210 POKEZ,65 J=20 POKES1,0 POKES3,0 FORK=1TO20 C=250
3220 FORI=1TOJ POKES1,C-2 C=C-2
3230 NEXTI C=C-10 J=J-1 NEXTK POKES2,0
3231 POKEZ,32 ME=ME-1 POKEML,102 ML=ML-1 IFME=0THENSYS2620 GOTO3350
3233 Z=8099 IFPEEK(A1-2)<>32ANDPEEK(A1-2)<>113THEND1=-1
3240 RETURN
3350 POKES2,15 POKES1,0 M=15 POKES3,M PRINT"■WANT ANOTHER GO (Y/N)?■" GOSUB3364
POKES3,0
3352 FORI=1TO23 FORK=1TO10 NEXTK SYS59765 FORP=1TO10 NEXTP NEXT
3354 RUN
3355 POKE198,0 WAIT198,1
3360 IFPEEK(197)=26THENEND
3361 RETURN
3362 GOTO3355
3364 POKES3,0 FORI=250TO210STEP-1 POKE36876,I FORK=1TO60 NEXTK,I POKES3,M M=M-1
3365 IFM=20THENPOKE36878,0 POKE36876,0 RETURN
3367 GOTO3364
3368 POKES3,0 POKES2,0 CLR RUN
3370 POKES3,0 POKES2,0
3380 GOTO3360
4000 PRINT"♥■" POKE36879,9 PRINT"      ■ALIEN ATTACK"
4097 POKE198,0 WAIT198,1
4098 RETURN
```

Alien Maze
by Fiwad Moied


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Character

on BBC Micro

This is a utility program for the BBC Model A or B. It enables easy programming of the user defined character set by positioning a cursor using the four cursor control keys and then pressing the space bar to set or reset the selected pixel.

The program when run prompts for the character number. This must be in the range 224 to 255. The character's present shape is then displayed full-size in mode 1 graphics. As each pixel is altered on the main grid the actual character is also changed.

The pixels shown on the drawing grid are normally reset or coloured red; when set they change to yellow. When you are satisfied with the shape you require press return to enter the character into the user character set.

The whole user set is shown from character 224 to 255 and is updated each time a new character is entered.

Below the character set display is the current character VDU line code, showing in decimal the value of each row of pixels (these also change as each pixel is set/reset).

After you have entered a character into the graphics set by pressing return, you will again be prompted for the next number to be programmed. The drawing grid will remain as for the last character, so if the next shape to be set up is drastically different from the last it may be quicker to press "c" to clear the drawing grid and start afresh.

Leave the program by pressing escape which sets mode 7 screen and restores the cursor keys to normal.

```
10 REM CHARACTER DEFINER
20 REM written by Robert Buttery
30 REM 4 June 1983
40 REM
50 REM
60  ON ERROR GOTO 1020
70 MODE1
80 @%=4
90 DIM A(8,8),count(8)
100  PROCinit
110 PROCsetchar
120 *FX4,1
130 PROCsetchar
140 VDU31,1,1
150 REPEAT
160   BIT=GET
170   IF BIT=139 AND Y>1 THEN Y=Y-1
180   IF BIT=138 AND Y<8 THEN Y=Y+1
190   IF BIT=136 AND X>1 THEN X=X-1
200   IF BIT=137 AND X<8 THEN X=X+1
210   IF BIT=32 THEN PROCchangebit
220   IF BIT=13 THEN PROCsetcher:PROCsetchar
230   IF BIT=67 THEN PROCclear
240   VDU31,X,Y
250   UNTIL FALSE
260
270
280 DEF PROCchangebit
290 IFA(X,Y)=2 THEN A(X,Y)=1 ELSE A(X,Y)=2
300 PROCsetvalue
310 ENDPROC
320
330
340 DEFPROCsetvalue
350 count(Y)=0
360 FOR1%=1TO8
370   COLOURA(1%,Y)
380   IFA(1%,Y)=2 THEN count(Y)=count(Y)+2^(8-1%)
390   PRINTTAB(I%,Y)"*"
400   NEXTI%
410 PROCsetchar
420 ENDPROC
430
440
450 DEF PROCsetchar
460 PROCdisplayset
470 PRINTTAB(32,4)'        "
480 COLOUR2: PRINTTAB(15,4)"Enter CHR$ number ":
490 INPUT num
500 IF num <224 OR num >255 THEN 470
510 PRINTTAB(15,4)"CHR$ ";num;" = ";CHR$num;"
520 VDU31,X,Y
530 COLOUR1
540 ENDPROC
570 DEF PROCsetchar
580  VDU23,num,count(1),count(2),count(3),count(4),count(5),count(6),count(
7),count(8)
590 COLOUR3
```


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```
600 PRINTTAB(26.4)CHR$num
610 PRINTTAB(0.22)num" = ";:FOR1=1TO8:PRINTcount(1)::NEXT
620 MOVE0.350:DRAW0.250
630  ENDPROC
640
650
660 DEF PROCdisplayset
670 COLOUR3
680 VDU31.0.12:FORI%=224 TO 255 STEP 8
690   PRINTI%:"  ";
700   FORJ%=0 TO 6:PRINTCHR$(I%+J%);"    ";:NEXTJ%:PRINTCHR$(I%+J%)'' ';I%+7
710   PRINT
720   NEXTI%
730 COLOUR2
740 PRINTTAB(1.29)"SPACE=Set/Reset    RETURN=Store char.   'C'=Clear char.
 ESCAPE=Quit"
750 COLOUR3:GCOL0.2
760 MOVE0.400:DRAW1279,400
770 DRAW1279,660
780 DRAW0.660
790 DRAW0.400
800 MOVE0 350:DRAW0 250
810 DRAW1279,250:DRAW1279.350:DRAW0,350
820 ENDPROC
830
840  DEF PROCinit
850 COLOUR1
860 FORY= 1TO8
870   count(Y)=0
880   FORX=1 TO 8
890     A(X.Y)=1:PRINTTAB(X,Y)"*"
900     NEXTX:NEXTY
910 X=1:Y=1
920 VDU31.1 1
930 ENDPROC
940
950
960 DEFPROCclear
970  PROCinit
980 PROCsetchar
990 ENDPROC
1000
1010
1020 MODE7:*FX4
1030  END
```

Character
by R Butley

e treasure (no mean feat in itself) has to ien leave the castle (in which of course e adventure is set) and get to the eighbouring forest where he or she can eposit the goodies and get the points. haron would like to know how to get out th the treasure.

Richard Ashley tells me that there is the ld sinkhole down which you may jump ut while this manoeuvre will indeed take u to the forest there is a small snag — u may also drop some of the treasure.

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Please come you're our only hope.

There is an address on the other side of the paper and pausing only to crack the second oldest joke in Chandler take-offs (a man passed me "You got a light Mac?" I asked. No but I got a dark brown overcoat!" he replied) Dan Diamond hurries to the obligingly eerie graveyard and Franklin's Tomb.

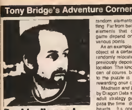
Taking my Courage in one hand and leaving the Whitbread behind (yup that's the oldest one) I strolled up to the door. Suddenly the ground gave way beneath me and I found myself falling falling

warning for the occasion. *Never anger dragon he might fume!*

This series of articles is designed for novic and experienced Adventurers alike. Eac week Tony Bridge will be looking at differen Adventures and advising you on some of th problems and pitfalls you can expect t encounter. So if you have an Adventure yo want reviewed or if you are stuck in a Adventure and cannot progress any furthe write to Tony Bridge Adventure Corne *Popular Computing Weekly* 12 13 Littl Newport Street, London WC2R 3LD


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Double diamond

Deep in the Darkest Home Counties, the Taylor family, for some time now, have been Dragon-punching in an attempt to solve *Madness and the Minotaur*.

This adventure from Dragon Data has been one of the perennial braintwisters for the machine and has prompted many letters to this column with pleas for help. The main problem used to be the Great Mushroom Hunt, but now most people seem to be able to find it. Michael Vesey, however, wonders what to do with it once it has been found. You won't learn any spells without it, Michael — be patient.

Mark, Amanda and Dad Taylor, though, have found many objects (like food, water bottle, dagger and golden flute) although they don't seem to have been able to get at the leather shield by jumping for it.

Apart from satyrs, sprites and troglodytes they have also met the Oracle, who has imparted several cryptic clues to the Taylors.

I would make a note of all the clues, famille Taylor; the information is bound to come in handy when you meet the creatures. Incidentally, you should resist the temptation to eat the tobo (is it mushroom soup?) at an early stage!

Frank Goldberg of Ealing also enjoys *M&M* but complains about the lack of a Save routine. It's a pity that this particular adventure, which seems to be an intricate and lengthy quest, cannot be halted in mid-game and returned to at another time.

Sharon Austin of Margate, while calling *M&M* "certainly the best in my collection (of programs)", is having great difficulty in restraining herself from smashing the computer. The trouble stems largely from the fact that the adventurer, having collected the treasure (no mean feat in itself), has to then leave the castle (in which, of course, the adventure is set) and get to the neighbouring forest, where he or she can deposit the goodies and get the points. Sharon would like to know how to get out with the treasure.

Richard Ashley tells me that there is the odd sinkhole down which you may jump. But, while this manoeuvre will indeed take you to the forest, there is a small snag — you may also drop some of the treasure.

One or two intrepid labyrinth wanderers have written to say that they find the random elements of *M&M* rather unsettling. Far from being random, however, the elements that change throughout the game depend on the player's actions at various points.

As an example, if the player deposits an object at a certain location, that object is randomly relocated unless the player has previously deposited an object at another location. This kind of intricate manoeuvring can, of course, be frustrating until the key to the puzzle is found, but is immensely rewarding once cracked.

Madness and the Minotaur is described by Dragon Data as a "fascinating real time adult strategy game", in which you can pass the time "doing battle with ferocious beasts". It's one of several adventures from this company, some of the other titles being *Quest*, *Black Sanctum*, *Calixto Island*, *Dragon Mountain* and *El Diablero*.

Now, if you are playing *Ring of Darkness* at the moment, you might find these tips of Tony Fowler's useful in your wanderings. You could gain some useful information in the pub, says Tony — but how to get people talking in a pub? Second, when the monster is in the distance, you may find it useful to have a noisy weapon. Finally, be very careful when attacking other characters — some are unbeatable.

Ring of Darkness is from Wintersoft — but they and Dragon Data are *not* the only software house producing adventures for the Dragon (Dragon Data are merely the glossiest). Salamander Software have just released a rather nice one called *Franklin's Tomb*. It's the first, they say, of a projected series all using "a different approach to other adventures, in that the graphics are supplied in a separate manual".

The separate manual is certainly a lavish affair, being a 20-page casefile "fully illustrated", as Salamander say. Well, 13 of the pages are fully illustrated with pretty pictures of the major locations.

But let Salamander's very own private dick set the scene: "My name is Diamond. Dan Diamond (known as Double Diamond, no doubt — TB). I'm a cop, at least I used to be. My beat is the city, a seething kaleidoscope of human emotion and solid steel. It was a muggy Monday morning, the sort of day that just lies there like a dead fish, staring at you. Suddenly the door opened and she walked in. You could cut paper with the creases in her uniform."

That's enough, you get the picture.

The broad has delivered a letter saying "Please come, you're our only hope". There is an address on the other side of the paper, and pausing only to crack the second oldest joke in Chandler, take offs (a man passed me. "You got a light, Mac?" I asked. "No, but I got a dark brown overcoat!" he replied). Dan Diamond hurries to the obligingly eerie graveyard, and Franklin's Tomb.

"Taking my Courage in one hand and leaving the Whitbread behind (yup, that's the oldest one), I strolled up to the door. Suddenly the ground gave way beneath me and I found myself falling, falling..."

And this is where you come in! To the accompaniment of the *Pink Panther* theme (don't ask me why) the title page gives the player another look at the letter (zero points to Salamander, here, for lack of imagination in designing the title page, a deficiency I've noticed in all Dragon programs — prove me wrong). Then the screen clears to make way for the display that will stay up for the rest of the game.

On the left are brief descriptions of the location you are currently at, along with what you can see. On the right is the inventory panel, in which the player will see a list of what is being carried at any time. A three-line box at the bottom of the screen is reserved for the player's input and the computer's replies.

The input should take the usual form, ie verb and noun, as in "*Take Lamp*" and so on — though, as this program is "Dragon Data approved", and as *Madness and the Minotaur* does not always follow this format, it may be worth trying other combinations of words.

Franklin's Tomb is written in Basic, but is reasonably fast in execution. It seems a little illogical in layout — from the starting location I went first of all to the east. Later I tried going west and found exactly the same things happening to me. Well, maybe it's a mirror adventure.

FT, unlike *M&M*, has a Save feature (as well as red herrings and blue kippers). It doesn't have a *Score* routine, however — in reply to your request for your score so far, the program just says "this isn't a football match". Some of the traditional magic words are recognised, so try anything that comes to mind.

All in all, good value, I think, and a game which should keep the old grey cells ticking over for a day or two. As I hinted before, *Franklin's Tomb* is the first in a series of related adventures, and some of the clues in the present program should be transportable to others in the series. Salamander are working on a version for the Oric, which should be ready soon.

Robin Hamilton writes from Loughborough to ask if there are any versions of the original mainframe adventure for the Dragon 32. I haven't noticed any, Robin, but if any software manufacturers have been sufficiently interested to have ploughed through the column this far, maybe they would let me know of any plans they have in that direction.

To round off our Dragon column, I hope that Henry Lee will allow me to adapt his warning for the occasion: *Never anger a dragon, he might fume!* ■

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further, write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.


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PEEK & POKE



NOISE FLOOR

Henry Cavey of Lime Crescent, Bishops Stortford, Essex writes

Q **Like other people, I have had trouble with my ZX81 *Load/Save*. My father asked someone at work, who knows about these things, what might be wrong. And he said that the tape's noise floor might be low, or that the azimuth might not be at its best. My father did not really understand and neither did I. I know that azimuth is to do with the recording head in my tape recorder, but what is a floor of noise? Can you explain?**

A Jargon strikes again! A frustrating and common disease, jargon can often cause more confusion than it saves. Still, a noise floor is a level of noise. It is not a phrase I have met before in computing. I think he simply means that the sound on the tape is not loud enough. It is generally taken that the output level of sound needs to be able to get up to 4.5v for successful *Load/Save* — 3v, for example, would be insufficient as the noise floor would be too slow.

Azimuth is more commonly quoted when referring to this problem. It does, as you say, refer to the tape head. Specifically, the angle of the tape head to the tape. This up to a point can be adjusted on some tapes to give a more tinny sound. This is better for *Load/Save* on a ZX81.

FUNCTION KEYS

Paul Rogers of Grange Crescent, Tenterden, Kent, writes

Q **I would like to know something about the Vic20 function keys. How do I use them and can I use them all the time to do things like *Poke* or *Print*?**

A I think, from your question, you would like to be able to use your function keys as soon as you switch on. This, I am afraid, you cannot do. As soon as the computer is turned off, any program is of course lost, whether it uses the function keys or not.

To use the function keys you have to check the keyboard to see if a function key has been pressed. The most common way of doing this is to use the *Get* statement, where you check the value of the depressed key. You can do this because all the keys have a code which you can compare with that of the function key to see if it was pressed. The odd numbered function keys have codes from 133 to 136, and the evens from 137 to 140. Try these three lines:

```
10 GET FK$ IF FK$ = "" THEN
   GOTO 10
20 IF FK$ <> CHR$(133) THEN
   GOTO 10
30 PRINT "YOU PRESSED FUNC-
   TION KEY 1"
```

We can extend this to read more of the keys. Keep line 10 and enter the following:

```
20 IF FK$ < CHR$ (133) OR FK$ >
   CHR$ (136) GOTO 10
30 IF FK$ = CHR$ (133) THEN A =
   5 GOTO 100
40 IF FK$ = CHR$ (136) THEN A =
   7 GOTO 100
50 IF FK$ = CHR$ (137) THEN A =
   2 GOTO 100
60 IF FK$ = CHR$ (138) THEN A =
   4 GOTO 100
100 PRINT "YOU PRESSED FUNC-
    TION KEY" A
```

In this example, I have kept the four keys I used in a single routine. It is quite possible to use the *If/Then* format to take you to a whole suite of subroutines. Indeed, one way of thinking about the function keys is to see them as a one-key entry into a sub-routine.

There is another way of reading the keys and this is to *Peek* addresses 197 or 203. These read the key pressed and return a specific value. Thus *F1* and *F2* would return the same value. Every key can be used in this way, but when dealing with the function keys specifically, the values are as follows:

F1/F2	39
F3/F4	47
F5/F6	55
F7/F8	63
No Key	64

As for using the function keys to replace commands, I do not know of a way of doing this, other than by rewriting the keyboard scan so that it returns a different value for the keys you want to reallocate.

SOFTWARE WRITER

Mehermosh Master of the Computer Training Centre, London, writes

Q **I am a newcomer, not so much to computing, but to the UK. I have read your magazine and liked its content. I have a 48K Spectrum and have written many programs for it, both games and business (some good, some not so good). I would like to sell them to magazines and software houses. Could you tell me some useful addresses where I can sell these programs and how long an answer would take.**

A At a conservative estimate, there are about 100 companies who would probably show interest in Spectrum software. There is no way I can name them all, but you could try companies like Silversoft, Quicksilva, Artic or Imagine. For more serious types of program, Campbell, Hilderbay and Calpac.

As for magazines, the software generally comes in fits and starts. So there is a build up from March to Easter that drops away during the summer, to pick up again later. You should look for an answer in about three and five weeks, but remember that it may take several months before the program is actually published.

Here are some guidelines:

(1) Always send a copy of the program on a good quality cassette tape.
(2) Always try and include a clear printout.
(3) Very important — always ensure that every item you send has your name and address on it, as well as the title of the program.
(4) If you want your material back, then also enclose an appropriate SAE.

Now to update a couple of previous answers. K H Bourke Burrows of Bibi Magnetics has written to add some extra information to the answer I gave to David Brown in the June 30 issue of *PCW*.

The International Electro-Technical Commission has not yet finalised a specification for computer grade cassettes, but the ECMA have decided on an international standard, ECMA-34. Tape must be as even as possible and unblemished; it must also be sufficient to retain the signals recorded on it faithfully. Cases should have thick pillars to hold the corner rollers; this helps cut torque, which of course causes wow and flutter. The other thing to look for is a strong large pressure pad to ensure even contact right across the playing head.

It boils down to the fact that just because a tape is C-10 this does not automatically make it of computer quality, though the smaller the tape size, the less the torque.

I have also had a letter from Miss Pam Fereday of Hove in Sussex, who writes to tell me of several computer and related indexes. The ones she mentions are:

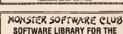
Computer and Control Abstracts. A world-wide index that includes most of the monthly journals, such as *Personal Computer World*, *Your Computer*, *Microcomputer Printout*, and so on.

Electrical and Electronics Abstracts. A sister publication to *CCA* dealing in electronics. Both publications contain indexes and abstracts.

Current Technology Index. Deals with mainly British journals in the field of technology generally. Eg *New Scientist*, *Electronics Weekly*, etc. However, it does not include the popular computing magazines and it is only an index, no abstracts are provided.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD.





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Address *101A Underdale Road Shrewsbury Shropshire*

Micro *Spectrum 48K*
Adventure *The Hobbit*
Problem *Where is the bow and how do you kill the monstrous dragon flying after you?*
Name *Robert Tench*
Address *32 Anglian Way Market Rasen Lincs*

Micro *BBC Model B*
Adventure *Philosopher's Quest*
Problem *I cannot get out of the ME passages after finding the portrait of Escher*
Name *Andrew Hunt*
Address *38 Roedich Drive Taverham Norwich NR8 6RA*

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Adventure *Pirate's Cove (Commodore)*
Problem *I need to know how to open the treasure chest which is found on Pirate's Island*
Name *D Hughes*
Address *13 Pitfield Gardens Baguley Wythenshawe Manchester M23 8EA*

Micro *ZX Spectrum 48K*
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Problem *Upon reaching the elvish clearing I become stuck. I have with me Thorin a sword rope large key map and a ring*
Name *Nicolas Pinnell*
Address *Penrhos Green Lane Churt Farnham Surrey*

Micro *BBC B*
Adventure *Castle of Riddles*
Problem *The happy little bat and the horrible blood sucking creature seem impassable and waving the rod in the dark passages merely produces coloured smoke Where do I go from there?*
Name *P J Ambrose*
Address *91 Dene Way Newbury RG13 2JN*

NEW RELEASES

CURSES

Snoops fans will be more than familiar with the Red Baron — the German World War I flying ace

Terminal Software now gives you the chance to emulate the Red Baron's legendary feats in *Super Dogfight* — a two-player game for the Commodore 64 Based on the original arcade game *Super Dogfight* is written in machine code and offers sprite graphics colour and sound and full screen wrap-around for uninterrupted play

Curse you Red Baron

Program *Super Dogfight*
Price *£9 95*
Micro *Commodore 64*
Supplier *Terminal Software*
28 Church Lane
Prestwich
Manchester M25 5AJ

BLACK HOLE

The Newbrain is one of those machines that has what media people call a low profile Although intended for fairly serious home users (and lacking colour), a number of software houses brought out games packages for the machine before news of Grundy's collapse was announced last month (*PCW* 23 31 August)

Grundy Business Systems produced software for both camps, ie games and utilities Most of the games are in packs of two which providing that both are of good quality is a nice idea

Quadrax/Space Battle gives you a sort of complicated noughts and crosses with a shoot-em up space game *Quadrax* requires you to beat the computer to a straight line of a chosen number on a grid — *Space Battle* is a two-player game each trying to destroy 10 of the other's ships without flying into a Black Hole

Program *Quadrax Space Battle*
Price *£9 95*
Micro *Newbrain*
Supplier *Grundy Business Systems*
Cambridge Science Park
Milton Road
Cambridge CB4 4BH

EDITOR

For those who need to store information and perform simple processing operations without going to the expense of a fully fledged word-processor like *Tasword* there is *Pagepro*

Pagepro allows you to set up pages of information and, to a limited extent, edit it Other facilities include copying to a printer and *Load/Save* of all information

Program *Pagepro System*
Price *£5 95*
Micro *Spectrum 48K*
Supplier *SD Micro Systems*
PO Box 24
Hitchin
Herts SG4 0AE

SOUPED-UP

Ants may not strike you as particularly fearsome creatures, but those found in Macronics' *Ant Attack* are different from the common or garden kind

Basically *Ant Attack* is a kind of souped-up caterpillar — souped-up because of the various other animals that turn up to help the ants in their attack

A feature on this game that could easily become a must on other games is voice control Assuming you have the correct kind of cassette player you can operate the fire control simply by speaking into a microphone!

Presumably, this idea could be extended to all the controls provided the Spectrum could be relied upon to distinguish between the sounds, and providing actually saying the word doesn't take too long for the kind of fast action response arcade games require

Program *Ant Attack*
Price *£4 95*
Micro *Spectrum*
Supplier *Macronics Systems*
26 Spiers Close
Knowle
Solihull
West Midlands B93 9ES

SLEIGH RIDE

Geordie software company Byteware is now producing games and educational programs for most of the popular micros

Bob Sleigh & Bio for the TI99/4A has two programs on one cassette In *Bob Sleigh* you must guide your sleigh down a twisting track There are four track widths and four speeds available

Bio produces your biorhythm charts for any 30-day period

Program *Bob Sleigh & Bio*
Price *£4 50*
Micro *TI99/4A*
Supplier *Byteware Ltd*
Unit 25
Handyside Arcade
Newcastle upon Tyne
NE1 4PZ

COSMIC

Stix, based on the arcade game *Qix* does not involve space invaders mutant camels or laser cannons

Instead, *Stix* consists of a bundle of energy that roams the universe destroying all in its path But a freak cosmic storm has trapped the *Stix* in hyperspace giving you the chance of controlling it by enclosing it with force fields

The game can be played with joysticks or direct from the keyboard

Program *Stix*
Price *£9 20*
Micro *Commodore 64*
Supplier *Supersoft*
Winchester House
Canning Road
Wealdstone
Harrow
Middlesex HA3 7SJ

PARCHMENTS

Invincible Island from Richard Shepherd Software is one of the company's first games not actually written by Richard Shepherd

Peter Cooke, author of *Invincible Island* has constructed an interesting split-screen graphic and text adventure for the 48K Spectrum Ancestral home of the mysterious Xaro tribe the island of the title contains unimaginable treasures But before you can find the treasure, you must first discover the seven parchments of Xaro

I must admit to being a little disconcerted to find that I usually did no better than you have scored a pathetic 0 But there is a useful Help facility though unusually it cannot be used during a game

All in all a very creditable addition to the Richard Shepherd stable But I must admit I am waiting to see if the next release is Invisible Island by Dudley Moore

Program *Invincible Island*
Price *£6 50*
Micro *Spectrum 48K*
Supplier *Richard Shepherd Software*
Elm House
23 25 Elmshott Lane
Cippenham
Slough
Berkshire

WORLD RULER



Wargamers are a dedicated breed always ready to spend hours pondering over the precise meaning of some new tactical advance by their fellow players — and using rule books more complicated than the most erudite ZX80 programming manual

Computers are a useful tool for wargamers since a typical game requires writing down all sorts of information, keeping track of things like supplies power levels etc

One of the leaders in the area of putting wargames on computers is Red Shift

State of the art for this kind of game may very well be *Apocalypse* which not eschewing big themes allows you to become a world leader and rule the world — using nuclear force if necessary

The game comes with four maps depicting various parts of the world you may wish to dominate and an elaborate instruction booklet Since the game is likely to last at least four hours, there is a *Save* option

Program *Apocalypse*
Price *£9 95*
Micro *Spectrum 48K*
Supplier *Red Shift*
12c Manor Road
Stoke Newington
London N16

GOLD MINE

Latest offering from Welsh software house Abacus is *Super Digger*

The plot is simple — you are working down a gold mine when suddenly you find yourself surrounded by hungry man-eating monsters Armed with a pick axe you must dig traps to catch the monsters or bash them over the head But, be warned sometimes the monsters will leave proximity mines which explode when you walk over them

Those of you with delicate sensibilities should also know that the monsters are lacking in table manners — after chomping on your bones they are apt to burp

Program *Super Digger*
Price *£5 95*
Micro *Spectrum 16K*
Supplier *Abacus*
716 Llangyfelach Road
Treboeth
Swansea SA5 9EL

POSTMAN

Perilous Post sounds like a kind of *Frogger* As the postman you must deliver a parcel to a house flashing red at the top of the screen

Your simple task is fraught with danger as first you cross railway lines then negotiate the river using boats and finally avoid the traffic wardens

You have a time limit for the delivery of each parcel (if only it were true) and are awarded a new van for every 10,000 points

Program *Perilous Post*
Price *£6 50*
Micro *Vic20*
Supplier *Impact Software*
70 Bedford Avenue
Edinburgh EH13 0BW

COPTER RESCUE

Byteware is offering a range of games for several machines including the TI994/A and the Commodore 64

It is interesting to note that Texas games seem to be far less often written in machine code than is the norm for other machines — perhaps because of the difficulty of getting hold of technical information from Texas?

Writing in Basic another problem crops up because there is a difference between Texas Basic and Texas Extended Basic such that the best games require the latter For those people who have the Extension module Byteware has a couple of programs that utilise its extra facilities

Copter Captive first requires you to collect keys and escape from a room whilst avoiding your captors If you can escape you must use your helicopter to rescue your troopers — this is achieved by colliding with them

Program *Copter Captive*
Price *£7 95*
Micro *Texas TI99/4A (Extended Basic)*
Supplier *Byteware Unit 25*
Handyside Arcade
Newcastle-upon Tyne
NE1 4PZ

3D MOVIE

Silly Software seem to want to be a sort of Automata for the Dragon

Its first release is entitled *Movie Producer* and it has 3D graphics — on the cover of the cassette! Included with the actual program are a pair of red and green glasses that enable you to see the cover in 3D

It appears to be a sort of adventure game As ever the objective is to accumulate money and power, but here you achieve it by making a film

The game begins in Wardour Street where you must first try to sell your script Having sold it you must then make your movie each day costing you 500 dollars

The game features graphics and music as well as (to be taken with a modicum of sodium carbonate I think) a claimed 25 billion levels of play

Program *Movie Producer*
Price *£7 95*
Micro *Dragon 32*
Supplier *Silly Software*
61 Tornhill
North Weald
Epping
Essex





Grammar gripe

Grammar, n A system of pitfalls thoughtfully prepared for the feet of the self made man along the path by which he advances to distinction
The Devil's Dictionary by Ambrose Bierce

When it comes to writing I am very particular about the words I use

I don't like the use of contractions such as can't because they're clumsy and possibly reveal a lack of command of English and we're only too aware that that leads to inclarity of thought The ending of sentences by a preposition is also something I can't put up with

Another rule to follow is never to use exclamation marks! And NEVER to capitalise And never start a sentence with a conjunction But that's only sensible isn't it!

A pet hate and it's all around us in it's misuse is the confusion between it's (which is short for it is and thus its wrong to use it anyway) and its (which means belonging to it that is it's definition)

Always a verb in a sentence

Examples of misuse are everywhere and it can sometimes be important Some word processing packages now offer help with spelling and one in use with the US Army also helps with simple grammar The simple grammar is needed to help write manuals that the semi literates amongst the draft might possibly understand

Having an army which contains people who are not able to distinguish between buttons marked Do not press explosive and Coffee white with sugar must be worrying

How can you obey orders if you cannot read them never mind understand them?

In *Communications Management* (August 1983) in a feature about telecommunications satellites I read "It is now 21 years since the world's first experimental commercial communications satellite Telstar I provided direct exchange of television broadcasting across the Atlantic some five years after the USSR put Sputnik I into orbit

I have no quarrel with the feature, indeed it was interesting But consider the short quotation and see what a computer might do A computer would do nothing — the sentence is grammatically correct and clear in meaning

The meaning is not however that intended by the author (or so I hope)

As the sentence reads Sputnik was launched five years after Telstar " some five years after the USSR put Sputnik I into orbit"

I know and you know that Telstar came five years after Sputnik and that was what was meant by the author Somewhere between the author having his idea to talk of Sputnik and the words appearing in the magazine an extra comma intruded

How did we know what the author was meaning even though it did not so appear? Experience, and knowledge of the worlds a personal database of inconsidered trifles

Any computerised system would be useless when faced with such a problem — for a start the computer would not realise there was a problem

A computerised system to correct spellings and/or grammar is a simple expert system — working on probabilities and fuzzy logic — but the world of words is so vast that a computer cannot truly cope Many would maintain that our language is really our society in a different form (eg George Orwell in *1984*)

An expert system works with a set of rules a set of conventions Usually I — for example — follow the conventions of what is normally termed grammar Sometimes for effect I transgress those conventions How is an expert system to know which transgressions are intended and which are not? It is a convention that some conventions will be observed and others will be transgressed

There are two forms of reading or understanding efferent where the object is to acquire information as quickly as possible and aesthetic where the whole point is the experience of the reading or understanding itself

Expert systems might be better at coping with efferent texts (eg manuals) than with aesthetic texts (eg novels, or — worse still — my outpourings) ■

Boris Allan

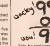
Puzzle

A rare breed

Puzzle No 73

Walter was one of that rare breed of wacky mathematicians!

He would never do things the conventional way if it could be avoided When once asked to work out the square root of 998001 he simply divided the six-digit number in half and added the halves together



This he explained gave the correct answer

How many other six-digit numbers can have their square roots evaluated in this wacky way?

Solution to Puzzle No 68

Answer 10 4 and 9 and 5 6 and Queen were the cards dealt

Let us call the first three cards *A B* and *C* and the second three *D E* and *F* Also *A* will denote the highest card

So

A + B + C = D + E + F

and

A × B × C = D × E × F

As all values are in the range 1 to 13 and all are different, the following program tests all possible permutations of cards

```
10 FOR A = 6 TO 13 30 FOR B = 1 TO A − 1 30 FOR
C = 1 TO A − 1 40 IF B = C THEN GOTO 140 50 FOR
D = 1 TO A − 1 60 IF B = D OR C = D THEN GOTO
130 70 FOR E = 1 TO A − 1 80 IF B = E OR C = E
OR D = E THEN GOTO 120 90 LET F = A + B + C −
(D + E) 100 IF F = A OR F = B OR F = C OR F = D
OR F = E OR F < 1 THEN GOTO 140 110 IF A * B * C
= D * E * F THEN PRINT A B C D E 120
NEXT E 130 NEXT D 140 NEXT C 150 NEXT B 160
NEXT A
```

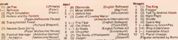
From the possible sets of values printed, there are two sets with a five present (10 4 9)/(5 6 Q) and (5 4 Q)/(3 8 10) So you will still have to use a little bit of telepathy to see inside the demonstrator's mind

Winner of Puzzle No 66

The winner is N Wheeler Cavendish Road Sutton Surrey who receives £10

Top 10





Spectrum
1 (1) Jet Pac (Ultimate)
2 (—) Schwass (Psion)
3 (2) Flight Simulation (Psion)
4 (3) Hobbes and the Spiders (Psion Melbourne House)
5 (8) Transylvanian Tower (Richard Shepherd)
6 (7) Horace Goes Skiing (Psion Melbourne House)
7 (6) Football Manager (Addictive Games)*
8 (9) The Hobbit (Melbourne House)
9 (10) Ah Diddums (Imagine)
10 (—) Pssst (Ultimate)
Requires 48K
(Figures compiled by W H Smith and Sons London)

Atari
1 (2) Diamonds (English Software)
2 (1) Miner 2049er (Big Five)
3 (—) Hellcat Ace (Microprose)
4 (3) Curse of Crowley Manor (Adventure International)
5 (—) Fire Fleet (English Software)
6 (4) Orc Attack (Thorn EMI)
7 (—) Air Beels (English Software)†
8 (9) Choplifter (Broderbund)
9 (7) The Boots of Blackpoole (Sirius)‡
10 (5) Zaxxon (Datasoft)
‡42K Disc Cartridge †32K Cassette
(Figures compiled by Calisto Computers, Birmingham 021-632 6458)

Dragon
1 (1) The King (Microdeal)
2 (2) Frogger (Microdeal)
3 (3) Talking Android Attack (Microdeal)
4 (6) Night Flight (Salamander)
5 (5) Shuttle (Microdeal)
6 (4) Space War (Microdeal)
7 (—) Monster Grand Prix (Microdeal)
8 (10) Ring of Darkness (Wintersoft)
9 (—) Katerpillar Attack (Microdeal)
10 (7) Planet Invasion (Microdeal)
(Figures compiled by Boots & Co London)



BBC
1 (1) Felix in the Factory (Program Power)
2 (—) Super Invaders (Acornsoft)
3 (2) Danger UXB (Program Power)
4 (3) 3D Bomb Alley (Software Invasion)
5 (8) Great Britain Limited (Simon W Hessel)
6 (5) Starship Command (Acornsoft)
7 (—) Centipede (Superior Software)
8 (—) Feasibility Experiment (Digital Fantasia)
9 (—) Demon Decorator (Program Power)
10 (7) Alien Swirl (Program Power)
All model B
(Figures compiled by Micro Management, Ipswich 0473 58181)



Vic 20
1 (1) Arcadia (Imagine)
2 (2) Skyhawk (Quicksilva)
3 (4) Wacky Waiters (Imagine)
4 (3) Cosmic Crunch (Commodore)
5 (6) Gridrunner (Llamasoft)
6 (8) Panic (Bug-Byte)
7 (9) Sargon II Chess (Commodore)
8 (7) Cosmiads (Bug-Byte)
9 (6) Catcha Snatcha (Imagine)
10 (10) Frantic (Imagine)
Cartridge
(Figures compiled by Boots & Co London)

Books
1 (1) Complete Spectrum Rom Disassembly *Logan and O'Hara* (Melbourne House)
2 (5) Commodore 64 Machine-code Master *Lawrence and England* (Sunshine)
3 (4) Assembly Language Programming for the BBC Micro *Birnbaum* (Macmillan)
4 (2) Structured Programming With BBC Basic *Atherton* (Horwood)
5 (6) Complete Forth *Winfield* (Sigma)
6 (—) BBC Micro Book, Basic, Sound and Graphics *McGregor and Watt* (Addison-Wesley)
7 (—) Programming the 6809 *Zaks* (Sybex)
8 (8) Spectrum Hardware Manual *Dickens* (Melbourne House)
9 (7) Z80 Assembly Language Programming *Leventhal* (Osborne)
10 ( ) Anatomy of the Dragon *James* (Sigma)
(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's position in brackets)

ZX81
1 (9) Chess (Psion)
2 (1) Space Raiders (Psion)
3 (2) Espionage Island (Artic)
4 (3) Flight Simulation (Psion)
5 (4) Fantasy Games (Psion)
6 (7) Football Manager (Addictive Games)
7 (8) Defender (Quicksilva)
8 (5) 1K Games (Artic)†
9 (—) Alien-oid (Quicksilva)
10 (—) QS Invaders (Quicksilva)
All 16K except where shown †Runs in 1K
(Figures compiled by Boots & Co London)

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is this a clue?

PIMAN EXPANDS

To celebrate the PIMAN's return to normal service, after your heartwarming response to his prickly pleas for original software to market, we at AUTOMATA are buying the little cult some new premises! In our mission to spread joy and happiness across the planet, we are moving into a dinky retail software outlet, (Dorothy's Woolshop, honest), down here in Pi-eyed Portsmouth Our friendly little shop, zany whacky offices, 17 tons of rubble, garden full of a red setter and exotic weeds not to mention Lurch The Office Parrot (I told you not to mention Lurch The Office Parrot) are at the NEW ADDRESS printed above this week's Krummy Kartoon Strip So will our customer please write it down next time they allow you a sharp object in that wierd hospital We'll be selling exciting specially selected excellent software cassettes and our staff are highly trained in assisting customers You know, we're going to have to stop writing this garbage on the back cover of Popular COMPUting Weakly, and adVERTISE A FEW of our wonderful programs. Ho-hum, maybe next week I mean who writes this stuff anyway, it certainly ain't me By the way, did I ever tell you about the time the Piman met this Israeli nun, and they went to a ..CRIPES! IT'S THE MEN IN THE WHITE COATS AGAIN gerrrrroffmeeeee

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